The Forest Resources Of Ontario 1986

Forest Resources Group
Ministry of Natural Resources

86-08-14

Ontario
Ministry of Natural Resources

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Printed in Ontario, Canada

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Ontario Forest Resources Highlights

1. The total area of Ontario is 106,862,000 hectares. The area covered by the forest resources inventory (FRI) is 61,566,723 hectares or 57.6%.

2. Land occupies 86.2% or 53,083,076 hectares of the surveyed area and water covers 13.8% or 8,483,647 hectares of surveyed area.

3. Forests cover 86.9% of the surveyed land area or 46,108,528 hectares. Productive forest land, totalling 39,927,519 hectares, occupies 75.2% of the total surveyed land area while 11.6% is non-productive and 13.1% is non-forested land.

4. Five and a half percent of the productive forest land is classified as protection forest and another 6.1% is classified as production forest reserve.

5. Eighty four percent or 33,646,186 hectares of productive forest land is owned by the Crown while 5,898,224 hectares are private and 383,109 hectares are federally owned.

6. The total volume of wood standing in Ontario is just over 5.1 billion cubic metres. Nearly 4.4 billion cubic metres of this volume is on Crown land and only 5% or 0.2 billion cubic metres of this volume is in provincial parks and recreation reserves. The growing stock on private lands is about 13% of the total volume or nearly 0.7 billion cubic metres, while that on federal land makes up only 1%.

7. The most abundant species in Ontario is spruce which makes up 40% of the total growing stock volume or just over 2 billion cubic metres. Jack pine represents 12.8% of the total volume while 19.8% is poplar, 7.5% is hard maple and 7.2% is white birch.

The Forest Resources of Ontario 1986

Introduction

Ontario's economic well being depends to a large degree on a strong forest industry and thus on the condition of its forests. Forest products industries played a key role in the development of Ontario's economy. Today the forest industry is still one of the most important economic sectors employing approximately 150,000 people either directly or indirectly. In addition, many northern communities such as Iroquois Falls and Espanola depend on healthy forest products markets and an adequate supply of wood for survival. The forests that this industry depends upon as a source of raw material were shaped by natural processes of growth and depletion by fire, insects or disease and by logging. The future of the forests and the industry depends in part on the present condition of the forests and in part on how we manage these forests now and in the future.

The Forest Resources of Ontario, 1986, is a compilation of the most recent data on the makeup of Ontario's forests. It highlights the complexities faced by forest managers and outlines the changes occurring in data-gathering and interpretation processes.

Figure 1 shows how wood production has increased on Crown land forests since 1867. The major period of white and red pine logging was in the late 1890s and early 1900s. The period of initial pulpwood use began mainly in the 1920s but pulp production expanded dramatically in the 1940s and by the 1984-85 fiscal year the annual wood harvest from Crown lands amounted to 20.7 million cubic metres. Another 2.6 million cubic metres are harvested from private lands annually.

Until the early 1960s forestry activities, primarily in Northern Ontario, were limited to harvesting timber, wood measurement (i.e. scaling), and protection. Regeneration lagged behind for two reasons: industry was uncertain regarding tenure, and the necessary expertise in artificial regeneration had not yet been developed. Following the amendment of the Crown Timber Act in 1962, which gave responsibility for regeneration to government, major initiatives in site preparation, planting, and seeding began. In the 1960s and 1970s there was a growing recognition that the increases in wood extraction could not be sustained into the next century without further improvements in the utilization and regeneration of Ontario's forests. In 1972 Ontario adopted a Forest Production Policy which set a provincial production target of 25.8 million cubic metres of industrial roundwood on an annual basis by the year 2020. This target was based on projections of wood demand and provides the basis for Ontario's regeneration program. An implementation schedule, setting annual targets for the regeneration, site preparation, tending, marking, and planting-stock production needed to achieve the target was first developed in 1973 and later revised in 1976 and 1983.

Figure 1: Ontario Annual Roundwood Production.
Crown Lands — All Species — 5 year Average

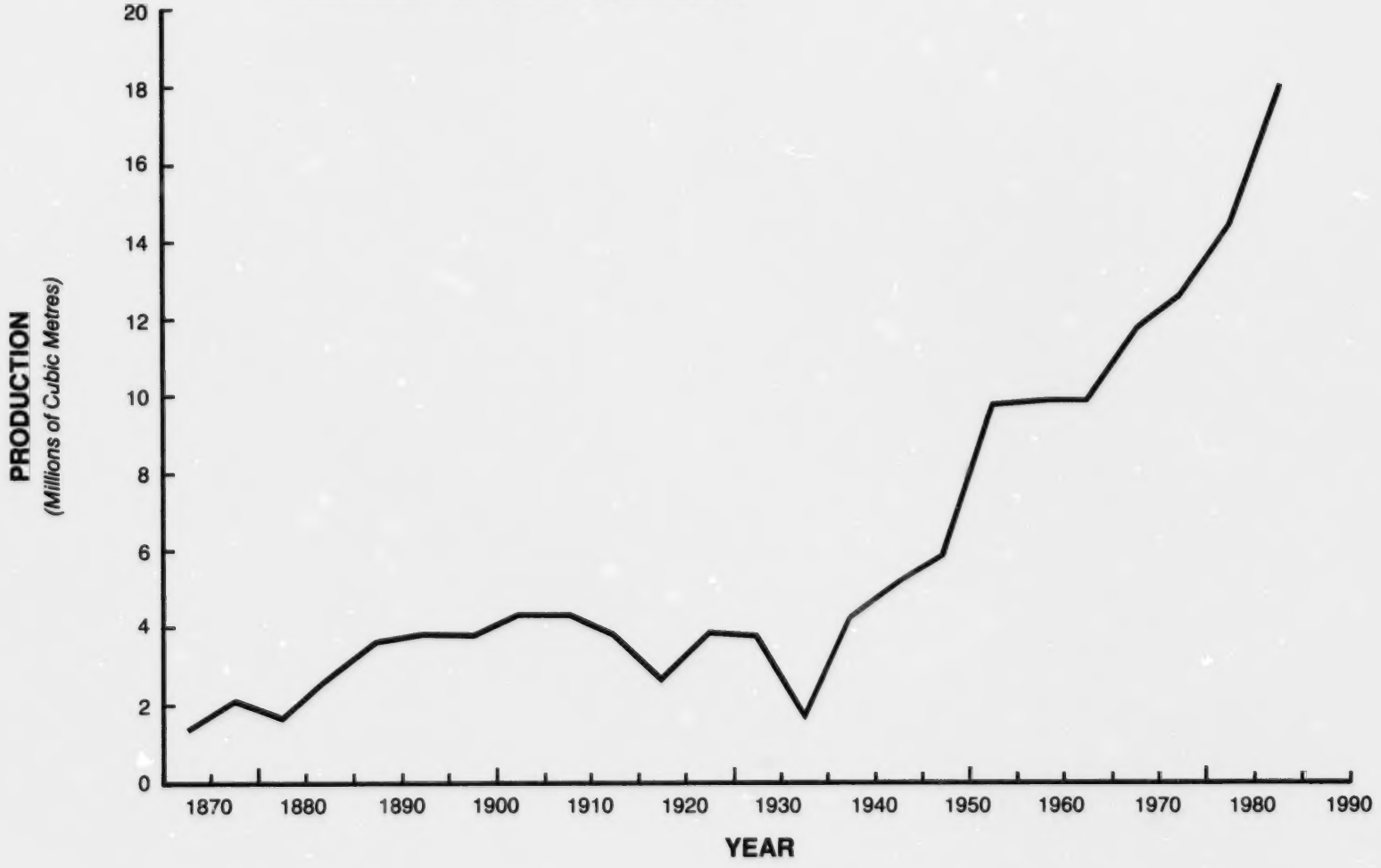
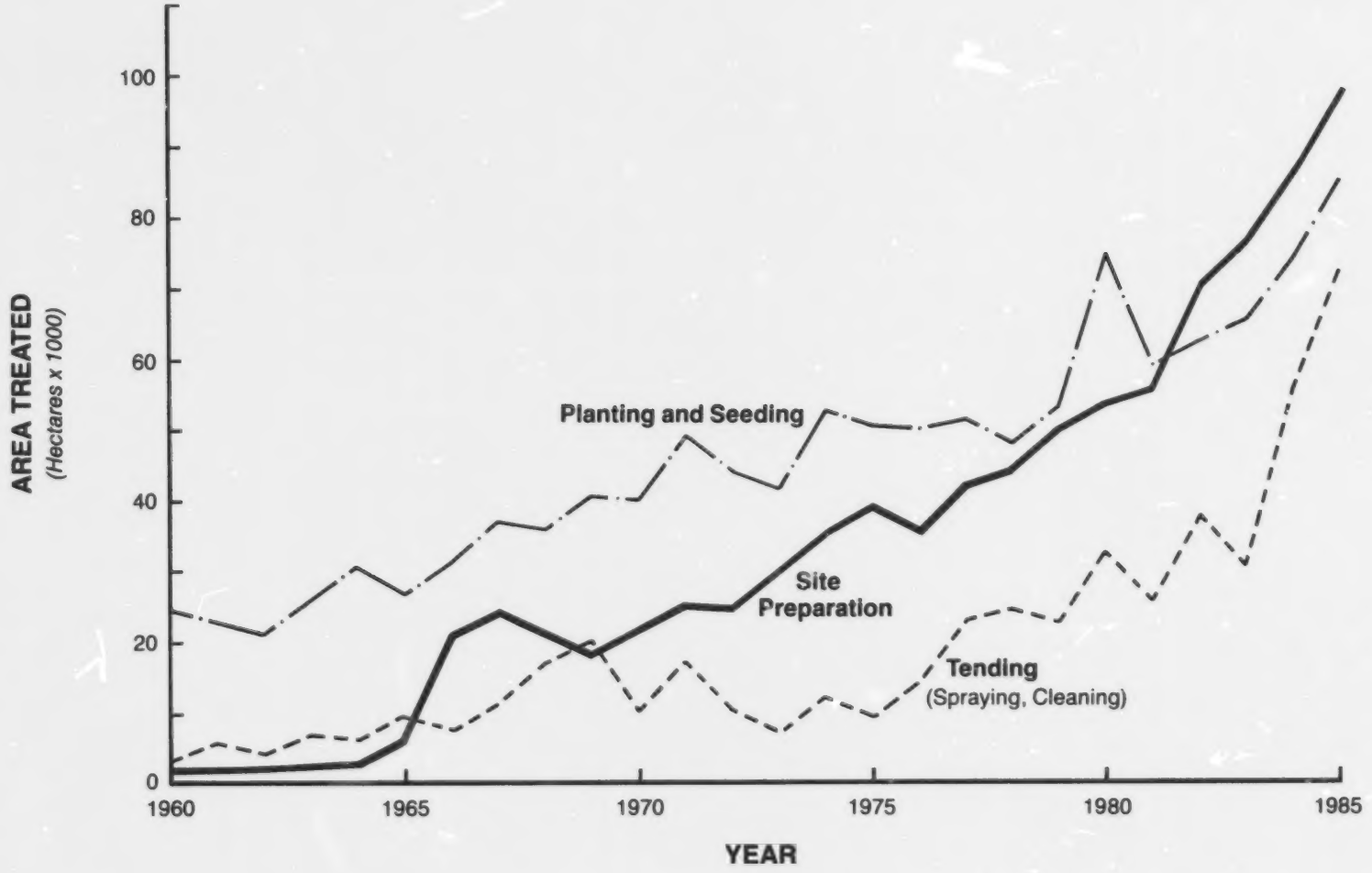


Figure 2 shows how planting, site preparation, and tending have increased in Ontario since 1960. In the past much of this regeneration effort has been directed to the cutover areas. In the future the Ministry of Natural Resources and Forest Management Agreement holders will be adopting a prime sites approach. This strategy will direct artificial regeneration programs to the sites which will produce the highest returns for the dollars invested while ensuring natural regeneration on the remainder. The location of prime sites will depend on three factors: site characteristics such as productivity and the degree of competition from undesired vegetation, the accessibility of the site and its proximity to mills, and the value of the end product that is produced from the species grown on the site. For example, a prime site might be a highly-productive site (in terms of wood volume) where a high degree of competition makes establishment costs high but where returns are also very high or it may be a less productive site where low yields are offset by less severe competition and therefore lower establishment costs. In addition, sites which are close to mills will be preferred for investment purposes to more distant sites which have similar wood production capabilities. Finally, the sites that can produce species used to make high-valued products will be preferred to sites which may be as productive but with species whose end products are less valuable.

This strategy will enable the Ministry to establish the new man-made forest which the forest industry will depend upon in the future. However, moving to a prime sites approach will also mean modifying harvesting practices. In the past the harvesting strategy has been to cut the oldest and often overmature stands first so that the maximum amount of wood could be harvested from the old, naturally-created forest. The Ministry has recognized that there are costs to this harvesting strategy. Strict adherence to the oldest-first principle would mean that large expenditures would have to be made to build access roads and that younger but biologically and economically mature stands on prime sites would have to be bypassed. Clearly there are tradeoffs to be made between harvesting the old forest and harvesting the biologically-mature but younger forests on prime sites. As a result, the Ministry and the companies will be modifying their harvesting strategies to permit harvesting of younger stands on prime sites, thus facilitating the prime sites regeneration strategy.

Although regeneration efforts increased in the 1960s and 1970s, it became apparent that integration of harvesting and regeneration was most feasible when both were planned for and undertaken by a forest company. To bring this about the Crown Timber Act was amended in 1979 to permit the Minister of Natural Resources to enter into Forest Management Agreements with forest companies. These agreements legally bind the companies to manage their areas on a sustained yield basis. There are now 28 FMAs covering 16,268,900 hectares or 63% of the licensed area in the province. The agreements place all responsibility for planning, regeneration, and other silvicultural activities with the companies. Recently, the first five FMAs were subjected to the first five-year review as required by the crown Timber Act. The review committee found that all five of the companies met their obligations under the

Figure 2: Planting and Seeding, Site Preparation and Tending Trends in Ontario since 1960.



agreement with the exception of harvest plans which were not fully implemented. The companies kept up with cutover areas with their regeneration efforts, treated more not-satisfactorily-regenerated (NSR) areas than they were obliged to and increased regeneration on the FMA areas from the previous five-year term by 43%.

When the Forest Production Policy was developed non-consumptive uses of forests were identified in a report entitled "Forest Production Policy Options for Ontario" (72). These non-consumptive uses included recreational opportunities, environmental benefits, social and water quality enhancement benefits. Although these benefits were not quantified in the analysis of policy options, the report acknowledged that effective forest management will have to be sensitive to these values in order to ensure that the greatest benefits are derived from Ontario's forest resources.

In the early 1970s, land use planners also saw a need for a more comprehensive approach to land use planning. As a result, the Ministry embarked on the strategic land use planning process. Strategic land use plans were developed for two broad planning regions in northern Ontario and a coordinated program strategy was developed for southern Ontario. These broad land use plans and strategies, published in 1983, provided direction for the development of district land use guidelines which provide a more specific framework for the integration of such resources as timber, parks, fisheries and wildlife at the field level.

Application of the Environmental Assessment Act to forest management activities in the province, including FMAs, also requires consideration of other uses of the forest and compliance with the EA Act requirements in the planning of forestry operations. Those requirements include consideration of alternatives and the environmental implications of forestry operations and the provision of opportunities for public consultation at various stages in the preparation, review, and approval of timber management plans, whether produced by MNR or the forest companies.

The Ministry has also realized the importance of managing private forest lands which supply approximately 18% of industrial round wood in Ontario annually. The Ministry, therefore, attempts to encourage private landowners to manage their forests through Woodlands Improvement Agreements (WIA) and Advisory Services Agreements (ASA) as well as the Ontario Managed Forest Tax Rebate program. There were over 10,000 WIA and ASA agreements active in the province as of March 1986. This brings the total private land area managed under these agreements to 146,463 hectares.

In addition, the Ministry manages under agreement approximately 111,000 hectares of forest land for regional municipalities, counties, Conservation Authorities and others, including one private company.

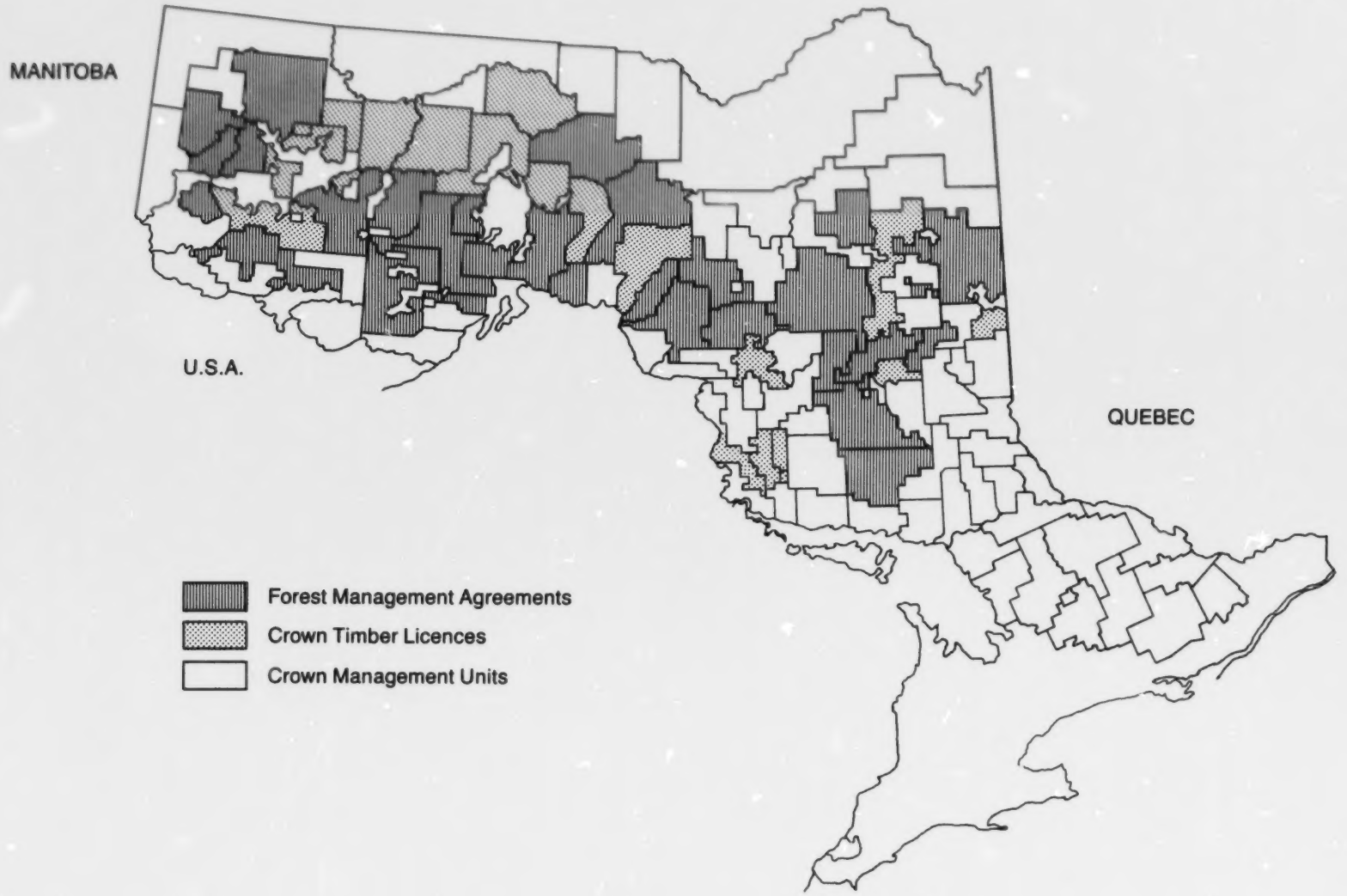
The Forest Resources Inventory

Planning for rational development, utilization and management of Ontario's forest resources, whether by government or industry, on Crown land or private land, depends on a sound knowledge of the extent, nature, and condition of today's forest. The forest resources inventory provides a picture or an approximation of existing forest conditions and an information base for decision making and planning for a variety of resource managers. The basic statistics, maps, and photographs are useful for forest access planning, silvicultural planning, forest protection planning, and other forest management related activities. They are also useful to land use planners and to wildlife managers who can gain inferences about wildlife habitat from the maps and data. Finally, fire managers can use covertype maps to aid in recording and evaluating impacts of fire on present and future wood supplies as well as for modelling fire behaviour.

In Ontario, forest resources inventory (FRI) data are available to forest managers and the public in several forms. These include forest stand maps which delineate individual stands and give important information needed to manage forest resources. This information also is available in the form of six standard FRI ledgers on a management unit basis. The management plan for each unit contains a full inventory summary for the unit area. These inventory data have been aggregated to provide regional and provincial summaries in this report.

The first report summarizing the entire forest resources inventory for Ontario was published in 1963 (The Forest Resource of Ontario). The report was compiled from data collected in the first surveys of forest resources in Ontario, completed between 1946 and 1959. Approximately 1/20th of the territory under inventory is photographed and surveyed every year which means that the inventory cycle is 20 years and that each forest management unit (see Figure 3) is re-inventoried once every 20 years. These surveys are carried out by the Ministry of Natural Resources and are a cooperative effort between the Ministry and forest companies with long term licences and Forest Management Agreements. Inventory coverage extends from the extreme south of Ontario northward to a latitude of 50.00 N in northeastern Ontario and 52.00 N in northwestern Ontario.

Figure 3: Forest Management Units in Ontario, 1986.



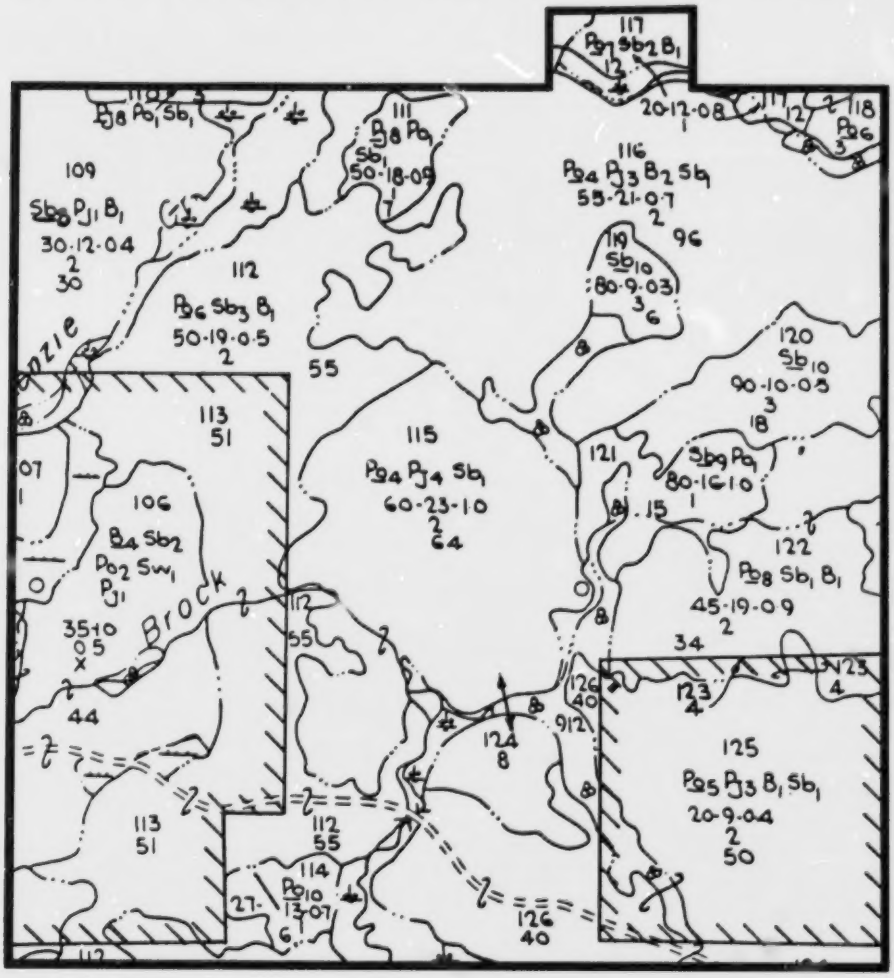
For each management unit the process of providing forest managers with forest resources inventory data takes three years. In the first year, aerial photographs are taken in the spring and summer. In the second year, ground crews measure sample plots chosen for accessibility and representativeness with a sampling intensity of approximately one per square mile (one per 2.59 km^2). The ground crews use photos and plot data to photo-interpret and describe individual forest stands over the entire photographed area in the winter. Forest stands are defined as an aggregation of trees possessing sufficient uniformity in composition, structure, age arrangement or condition to be distinguishable from adjacent vegetation. Forest stands form the basic silvicultural or management planning unit and they are described by the interpreters in terms of important management variables such as area, species composition, stand height, stand age, stocking, site class* and volume. Finally, in the third year, the stand data are validated, transferred to stand maps and entered into a computerized data base system which produces standard Forest Resources Inventory reports and the regional summaries presented in this report. The maps are professionally drafted and produced at two scales. Forest stand maps (see Figure 4) of single townships are produced at 1:15,840 scale while composites for each management unit are produced at a scale of 1:50,000.

Stand volumes are calculated using normal yield tables** (see table 1) in a three-step process. First, using stand historical data, plot data, or any other reliable information, photo interpreters determine stand age in five-year age classes. Second, using stereoscopes, stand heights are determined from aerial photographs. An age and height relationship determines the site class of the stand (see Figure 5). Once the site class is identified the appropriate normal or fully stocked volumes can be read directly from the yield table. Finally, stocking*** is estimated using a relationship between crown density (estimated from the aerial photographs) and stocking (estimated using normal yield tables at the field sample plots). Stocking level, expressed as a percentage, is multiplied by the normal yield (see table 1) to estimate the actual stand volume per hectare. Total stand volumes can then be estimated by multiplying the area of the stand by the volume per hectare. Aggregate volumes for management units, regions, or the province as a whole can be obtained simply by summing individual stand volumes.

More costly operational surveys or operational cruises may be carried out, using field sampling techniques only, on areas which are scheduled to be harvested within five years. They provide additional information concerning the size and quality of timber, a very important factor in determining the end use. Size and quality is particularly important to companies operating sawmills or veneer mills but less important to those operating pulp and paper mills.

***Site class is a measure of the productive capacity of a site for a particular species.**
****Normal yield tables reflect potential productive capacity of optimally stocked natural stands.**
*****Stocking is an expression of the adequacy of tree cover on an area expressed in the inventory as a ratio between actual stand volume and normal stand volume at a given age.**

Figure 4: A Portion of a Forest Resources Inventory Stand Map.



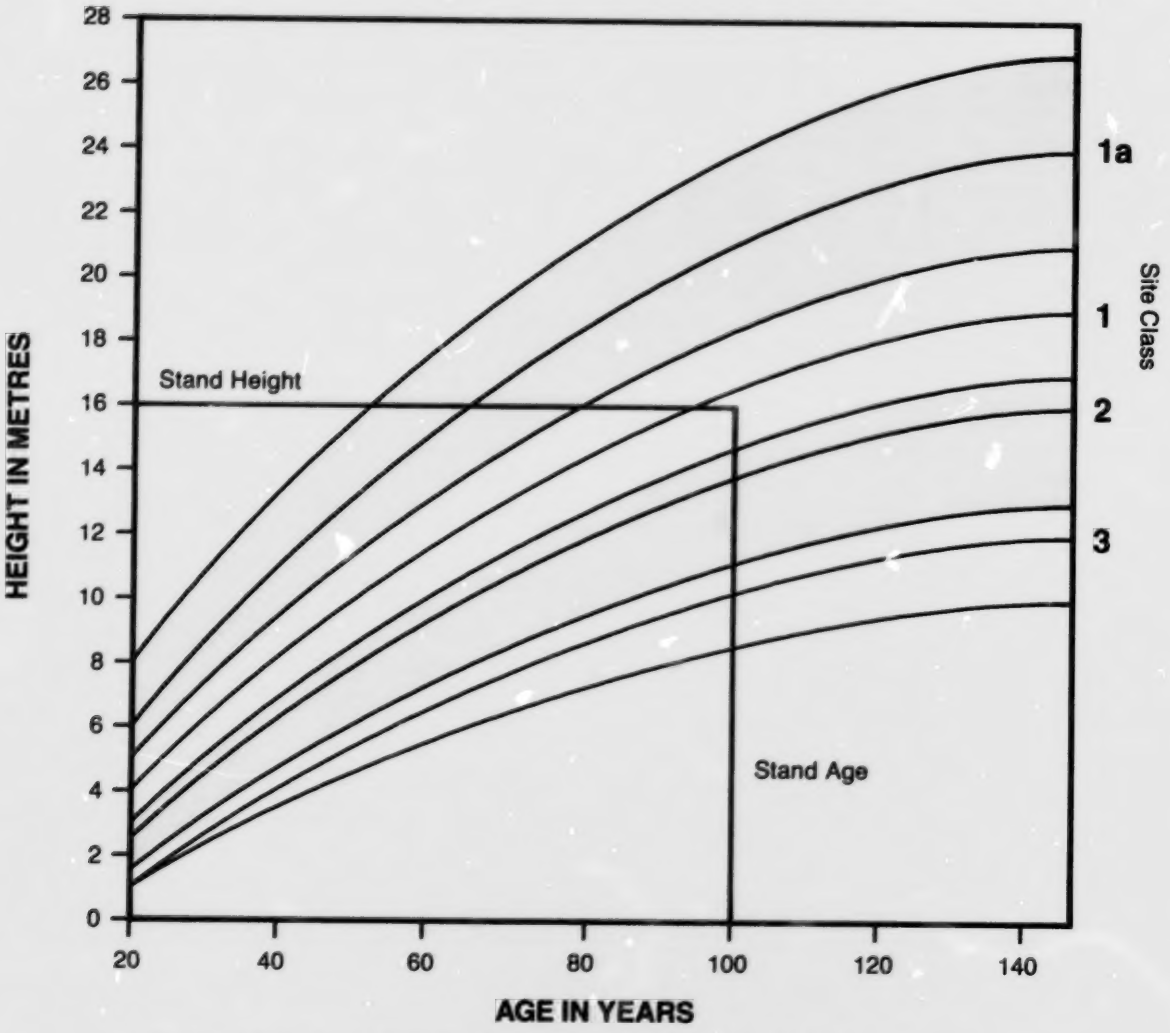
Legend

109	–	Stand Number
Sb, PJ,, B,	–	Working Group (Underlined)
30 – 12 – 0.4	–	Age, Height (Metres), Stocking
2	–	Site Class (X is Site Class 1A)
30	–	Area in Hectares
	–	Stand Boundary
	–	Open Muskeg
	–	Brush and Alder
	–	Grass and Meadow
	–	Delineates Patented Land
	–	Intermittent Stream

Working Group Codes

Sb	– Black Spruce	> Spruce Working Group
Sw	– White Spruce	
B	– Balsam Fir	
Pj	– Jack Pine	
Po	– Poplar	

Figure 5: Height — Age Relationship for Black Spruce.



A 100 year old Black Spruce stand with a height of 16 metres is in site class one. Therefore the site class one yield table is used to calculate volume.

Table 1: Normal Yield Table for Black Spruce.

Age	Site Class One Height	Site Class One Height Range	Gross Total Volume (M^3/Ha)	Site Class Two Height	Site Class Two Height Range	Gross Total Volume (M^3/Ha)
20	3.8	3.1 – 5	18	2.4	1.7 – 3	15
25	5.3	4.4 – 6.5	41	3.4	2.4 – 4.3	26
30	6.7	5.6 – 8	64	4.4	3.3 – 5.5	40
35	8	6.7 – 9.3	87	5.5	4.2 – 6.6	55
40	9.1	7.7 – 10.5	110	6.5	5 – 7.6	71
45	10	8.7 – 11.6	132	7.4	5.9 – 8.6	88
50	11	9.6 – 12.6	152	8.2	6.7 – 9.5	105
55	11.8	10.4 – 13.5	172	9	7.4 – 10.3	121
60	12.6	11.1 – 14.3	191	9.7	8.2 – 11	137
65	13.3	11.8 – 15.1	208	10.4	8.8 – 11.7	153
70	14	12.4 – 15.8	224	11	9.4 – 12.3	167
75	14.6	13 – 16.4	240	11.6	10 – 12.9	181
80	15.1	13.5 – 17	253	12.2	10.5 – 13.4	194
85	15.7	14 – 17.5	266	12.6	11 – 13.9	206
90	16.2	14.5 – 18	277	13.1	11.4 – 14.4	217
95	16.6	14.9 – 18.5	288	13.5	11.8 – 14.8	227
100	17	15.4 – 18.9	298	13.9	12.2 – 15.3	237
105	17.4	15.8 – 19.3	306	14.2	12.5 – 15.7	245
110	17.8	16.1 – 19.7	314	14.5	12.8 – 16	252
115	18.1	16.4 – 20	320	14.8	13.1 – 16.3	259
120	18.4	16.7 – 20.4	326	15	13.3 – 16.6	264
125	18.7	17 – 20.7	330	15.3	13.5 – 16.9	268
130	18.9	17.3 – 20.9	333	15.5	13.7 – 17.2	271
135	19.2	17.4 – 21.2	336	15.7	13.9 – 17.3	274
140	19.4	17.6 – 21.5	338	15.8	14 – 17.5	276
145	19.5	17.8 – 21.7	339	16	14.2 – 17.7	277
150	19.7	17.9 – 21.9	340	16.1	14.2 – 17.8	278

A 100 year old Black Spruce stand with a height of 16 metres has a normal yield of 298 cubic metres. If stocking is 0.7 then the actual yield is predicted to be 0.7 × 298 = 208.6 cubic metres per hectare. If the stand has an area of 100 hectares then the total volume of the stand is 100 × 208.6 = 2,086 cubic metres.

***NOTE,** The yield table in "Normal Yield Tables for Major Forest Species of Ontario" (Plonski 1981) also contains basal area, current annual increment, mean annual increment, and gross merchantable volume data. Only site class one and two height and gross total volume data are presented here.

There are several differences in the data collected in the current inventory and the inventory that was summarized in 1963. For example, the first inventory recognised only three broad species groups or covertypes for the purposes of volume calculations: conifers, hardwoods and mixed woods. Today each forest stand is assigned to one of 12 working groups. A working group is an aggregate of stands with the same dominant species and managed under the same broad silvicultural system. These working groups can also be aggregated in three broad forest types. White pine, red pine, jack pine, spruce, balsam fir, hemlock, and the other conifer working groups are included in the softwood forest type. The other conifer working group includes species such as eastern white cedar, and tamarack which occur too infrequently to be included in their own group. Poplar and white birch working groups are included in the intolerant hardwood forest type and the hard maple, yellow birch, and other hardwood working groups are included in the tolerant hardwood forest type. The other hardwood working group is similar to the other conifer working group, encompassing tolerant hardwoods occuring too infrequently to be classed in a separate working group.

Other changes may be summarized as follows:

1. Size or diameter class volumes reported in the 1963 summary are not recorded in the present inventory, but are obtained in operational surveys.

2. The original inventory had three age classes: mature, immature, and reproducing. The present inventory records stand ages in five-year age classes.

3. Site classes have been introduced since the 1963 report. Stands are placed in site classes based on height-age relationships such as that for spruce shown in Figure 5.

4. Normal yield tables were introduced after the completion of the first inventory and are now used to calculate volumes. In the first inventory the province was divided into ecological sections. For each section volume tables reflecting average volumes per acre over the section were created using data from field surveys for each of the three covertypes. These tables showed the average volumes per acre for each covertype and the average volumes that could be expected within each covertype over the entire ecological section by species, diameter classes, and density classes*. At the same time forests were being classified on air photos by covertype and age class (either mature, immature, or reproducing). To calculate volumes for each covertype and age class the total area of each covertype on a given forest area was multiplied by the volumes in the tables. Since each table showed volumes by species, size classes, and density classes, volume estimates for each of these classes could be obtained as well.

***A classification which separated stands by volume per acre, by covertype and age class (either mature, immature or reproducing).**

5. The class "reproducing forest" has been eliminated. The 1963 report defined this class as areas of reproduction too recently established to be classified into covertypes. Today working group classifications are made for stands down to the one-to-five year age class without considering the stability of the young forest stand's species composition. Instead stands are simply reclassified into appropriate working groups as the species composition changes over time. Stands which do not have sufficient stocking to meet Ontario's standards are classified as barren and scattered.

6. Two new classifications have been introduced with forest management agreements. Not-Satisfactorily-Regenerated or NSR areas are areas of productive forest land which are not stocked to a specified standard and have not attained Free-to-Grow status. Stands are Free-to-Grow when they meet a minimum stocking standard, when their height is at least one metre, and if they are judged to be essentially free from competing vegetation. The NSR category is similar to the barren and scattered class. However, in order to be classed as NSR, an NSR survey is required. NSR surveys cover all barren and scattered areas, recently depleted areas, and the one-to-20 year age class. Areas are placed into one of six NSR classes or the Free-to-Grow category. NSR class one is a transition category which covers areas which have regenerated to satisfactory stocking levels or are free to grow. NSR classes 2 to 6 require various types of treatments to bring them to Free-to-Grow status in the desired working group.

7. Foresters at the field level now have the ability to update forest resources inventory data with new computer software called FRIDES (forest resources inventory data entry system).

Forest Regions of Ontario

The distribution of forest tree species and the growth of these species is influenced to a large degree by climatic and physiographic factors. Two important climatic factors affecting the growth and species composition of our forests are temperature and moisture. Significant ranges in mean summer air temperatures, from 10.2 to 19.5 C, and total summer precipitation, from 340 to 476.5 mm, exist in Ontario. Local variations in climate are caused by topography, proximity to the Great Lakes, and prevailing winds. These climatic factors in combination with physiographic factors have a profound influence on forest vegetation in terms of species distribution and productivity.

The surficial features of Ontario's landscape are largely the result of the advance and retreat of glaciers. In southern Ontario, southwest of the Niagara escarpment, the bedrock is of Paleozoic origin and the typography is predominantly flat to undulating. The bedrock is overlain generally with deep fertile soils which generate most of the agricultural wealth of the province. The rolling and rocky topography of the Precambrian Shield underlies most of northern Ontario and is covered by a soil mantle of variable thickness with many lakes. These soils developed on deposits which lie on the Precambrian Shield as a result of glaciers which scraped materials from igneous, sedimentary and metamorphic rocks of the shield and then transported them southward. The transported materials were dumped behind in the form of morainal deposits, transported and deposited by rivers or deposited in lakes formed by melting glaciers. North of the Canadian Shield and adjacent to James and Hudson Bays is a large flat, poorly drained area of Paleozoic sedimentaries less than 150 metres above sea level. The soils that developed on these deposits have different characteristics important to the distribution and growth of tree species.

Three broad forest regions (Figure 6), characterized by a broad uniformity in physiognomy and composition of dominant species, occur in Ontario. Overlapping the deep fertile soils in Southwestern Ontario lies the only occurence of the Deciduous Forest Region in Canada. The region is heavily populated and thus the natural forest vegetation is restricted to farm woodlots and remnant stands on soils not economical for farming. Forest communities are dominated by broadleaved trees such as sugar maple, and beech. Commonly associated trees include basswood, red maple, and red, white, and bur oak. Species such as black walnut, sycamore, swamp white oak, shagbark and bitternut hickory, butternut, rock elm, silver maple, and blue ash are largely confined to this region. This region also is characterized by deciduous species such as tulip-tree, cucumber tree, pawpaw, red mulberry, kentucky coffee tree, black gum, redbud, blue ash, sassafras, mockernut and pignut hickory, and scarlet, black, and pin oaks which reach their northern limit here. Conifer species such as white pine, tamarack, eastern red cedar, and hemlock species have only a scattered representation in the region.

Figure 6: Ontario's Forest Regions.

North of the deciduous forest and lying along the Great Lakes, St. Lawrence and Ottawa river valleys is the Great Lakes–St. Lawrence Forest Region. This region also extends west of Lake Superior in a narrow strip west to Lake of the Woods and includes Sibley Provincial Park. The forest is characterized by a mixture of deciduous species common to the Deciduous Forest Region and conifers common to the Boreal Forest Region. Eastern white pine, red pine, and eastern hemlock are the prevalent conifers while sugar maple, red maple, red oak, and basswood are commonly associated broadleaved species. Wide distributions of white birch, trembling aspen, black and white spruce, white cedar, and jack pine occur while white elm, large tooth aspen, beech, white oak, butternut, white ash, and balsam poplar are common but restricted in occurence. This forest region's timber is primarily used for the manufacture of lumber, quality veneer, and furniture.

The Boreal Forest Region is the largest in Ontario and is the source of supply for major pulp and paper companies and, increasingly during the past 50 years, for sawmills and other types of companies as well. Primarily composed of conifers, the region is characterized by white and black spruce while balsam fir, jack pine, white birch, and trembling aspen are also common throughout the region.

At the transition between the Precambrian Shield and the Palaeozoic sedimentaries of the coastal plain the boreal forest changes character. The flat topography and poor drainage of the plain as well as the increasingly unfavourable climatic conditions cause the tree species to be reduced in number, size and distribution. The vegetation in this area has a 'subarctic' appearance because of the predominance of open woodlands comprised of black spruce and tamarack in muskegs and fens. However, riverbank levees are characterized by better drainage conditions favourable to more productive forests of white spruce, balsam fir, trembling aspen, balsam poplar, and white birch. As the coast of Hudson Bay is approached the percentage of peat land and lakes increases and a pattern of barren tundra and scattered patches of stunted black spruce and tamarack forest is characteristic.

The Forest Estate Now

A basic concern of forest resource managers is how much land is available for forest management. A useful starting point in answering this question is the classification of land in the forest resources inventory.

The area covered by the forest resources inventory is approximately 61.6 million hectares out of the total provincial area of 106.8 million hectares. Nearly 8.5 million hectares or 13.8% of this area is water and the total land area covered by the inventory is 53.1 million hectares. Nearly 87% or 46 million hectares out of the total land area is forested while almost 7 million hectares are classified as non-forested (figure 7). Non-forested areas are lands permanently withdrawn from timber production and they include developed agricultural land, grasses and meadows, as well as areas left unclassified by the inventory such as municipalities, roads, railways and power lines.

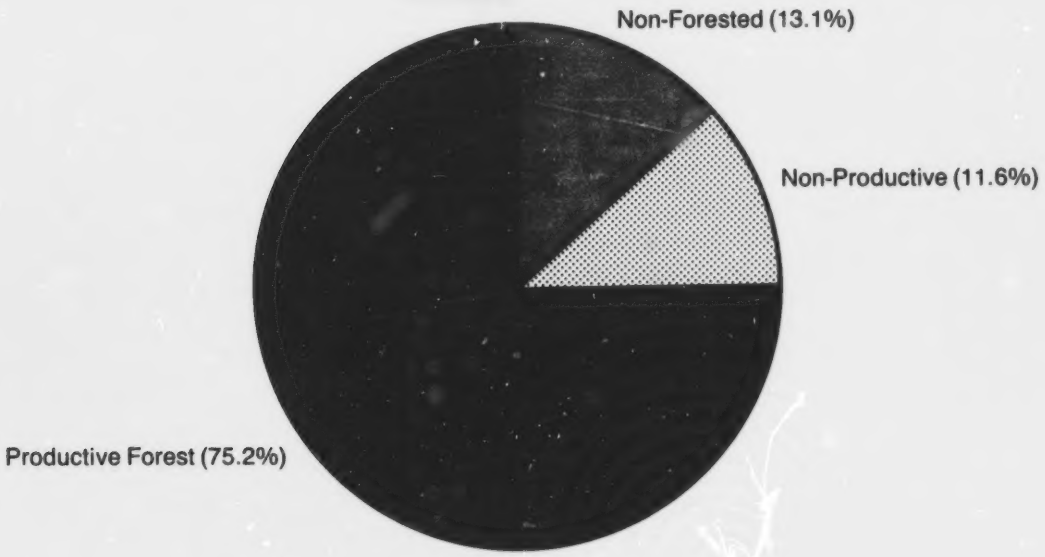
Treed muskegs, open muskegs, brush, alder swamps and areas of barren rock within forested areas represent lands which are permanently out of timber production because of extremely low productivity. These represent Ontario's non-productive forest land areas and they comprise over 6.1 million hectares, leaving approximately 39.9 million hectares of land classified as productive forest. Productive forest lands are those capable of growing merchantable timber. Ontario's productive forest land is classified further into protection and production forest. Protection forests are either lands with poor timber growing capability or islands less than 40 hectares in size. These lands cover 5.5% or 2.1 million hectares (see Figure 7 and Table 3) of the productive forest land. Although these forests are capable of growing commercial timber, doing so would be detrimental to the environment. Therefore, they are managed primarily to exert a beneficial influence on soils, waters, and the overall landscape.

The remaining 95% or 38 million hectares of productive forest is classified as production forest land. This class also is broken down into two sub classes. Production forest reserves* are those areas, representing 6.1% or 2.4 million hectares (see Figure 7 and Table 3) of productive forest land, which have significant silvicultural and forest management impediments. These may be extremely rocky soils, steep slopes or shallow soils. The remaining 88% of productive forest area is referred to as regular production forest which with current economic conditions and technology is suitable for commercial timber production. On a township and management unit level, production forest is broken down further into site classes indicating different levels of productivity. Productivity of site is an important criterion to the forest manager attempting to allocate funds for planting and tending to the areas where the greatest returns will be realized.

*Formerly these were termed Protection Forest Reserves.

Figure 7: Classification of the Province into Broad Land Classes.

Total Land Area = 53.1 Million Hectares.



Classification of Productive Forest

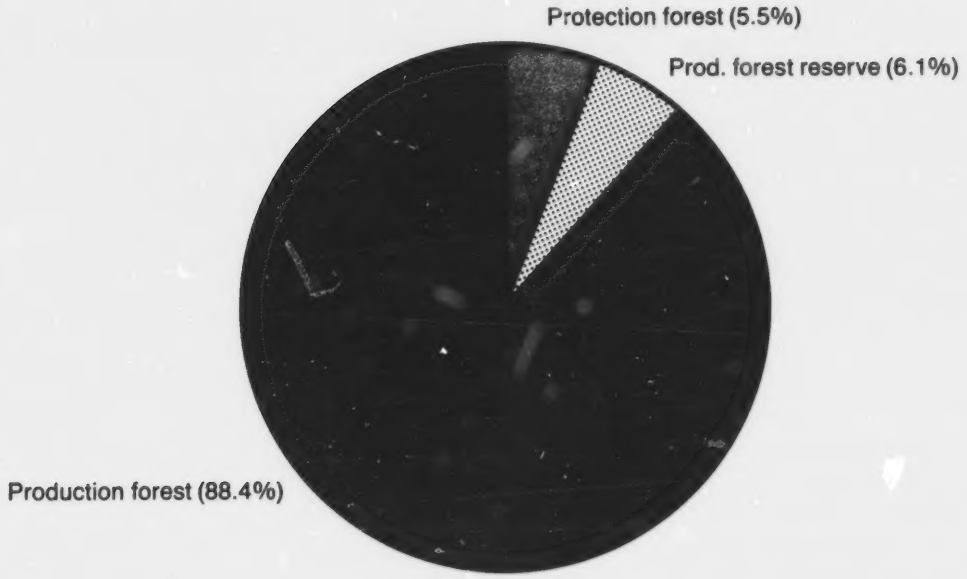


Table 2: Major Classifications of Ontario Covered by the Forest Resources Inventory (as of 1985).

(hectares)

Ownership	Water	Non-Forested	Non-Productive	Productive	Total
CROWN (1)	7,951,272	196,371	4,882,632	32,245,523	45,275,798
RECREATION RESERVES (7)	476	1,691	20,998	165,606	188,771
PROVINCIAL PARKS (5)	113,470	14,001	87,102	1,235,057	1,449,630
CROWN SUB-TOTAL	8,065,218	212,063	4,990,732	33,646,186	46,914,199
PATENT (2)	0	42	188	3,876	4,106
PATENT (3)	2,395	6,449,580	601,120	5,411,248	12,464,343
PATENT (4)	0	3,666	37,194	382,819	423,679
AGREEMENT FOREST (8)	0	4,187	8,856	100,281	113,324
PATENT SUB-TOTAL	2,395	6,457,475	647,358	5,898,224	13,005,452
INDIAN RESERVES (6)	3,444	185,701	60,490	140,541	390,176
OTHER FEDERAL (9)	412,590	119,309	482,429	242,568	1,256,896
FEDERAL SUB-TOTAL	416,034	305,010	542,919	383,109	1,647,072
TOTAL	8,483,647	6,974,548	6,181,009	39,927,519	61,566,723

Note: The numbers in parentheses e.g. (1), (2), etc. are the classes of land ownership used in the Forest Resources Inventory.

Table 3: Area of the Productive Forest of Ontario by Ownership (as of 1985).

(area in hectares)

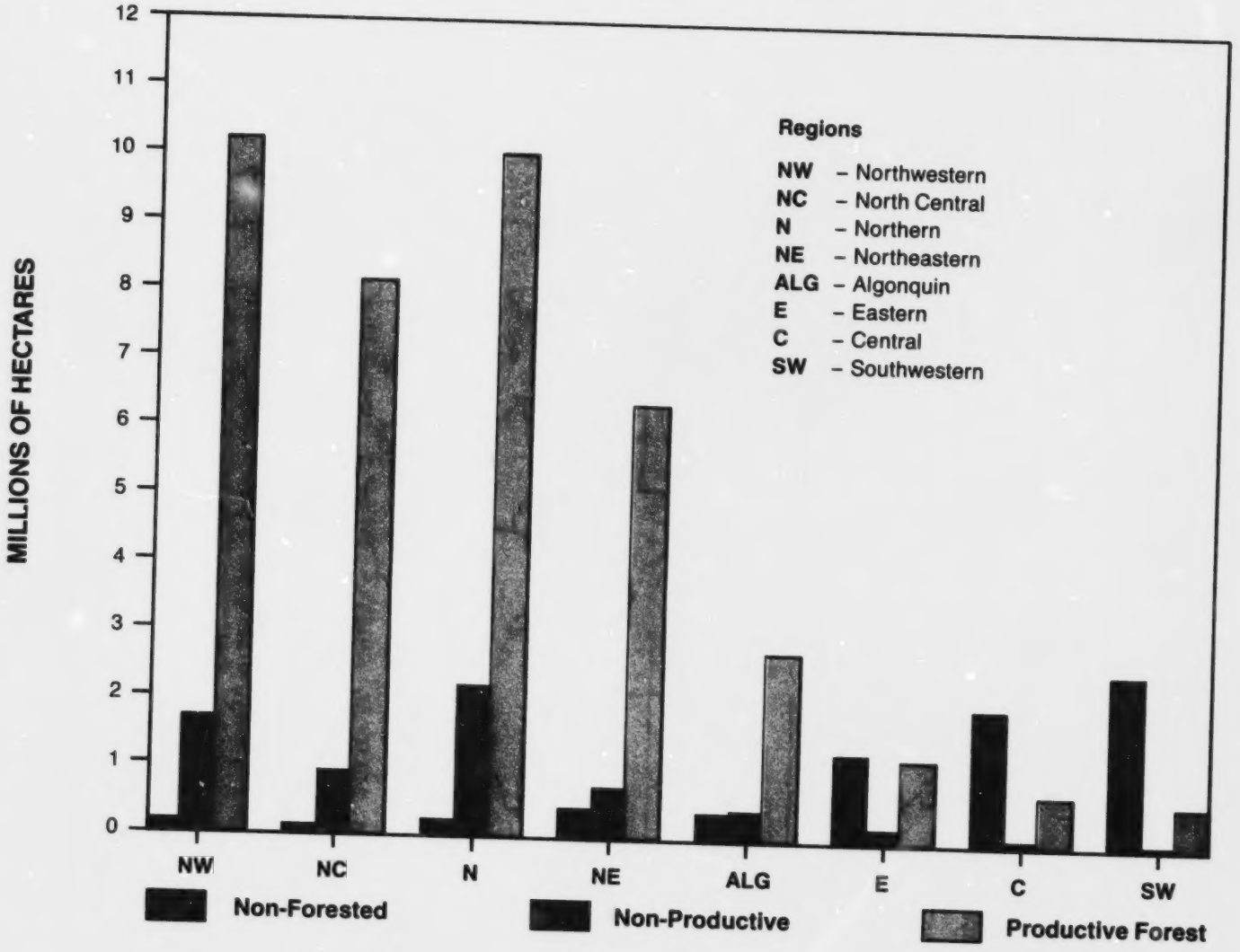
Ownership	Protection Forest (Area)	Production Forest Reserve (Area)	Production Forest (Area)	Total (Area)
CROWN (1)	1,861,292	2,052,668	28,331,563	32,245,523
RECREATION RESERVES (7)	8,711	23,437	133,458	165,606
PROVINCIAL PARKS (5)	47,871	70,061	1,117,125	1,235,057
CROWN SUB-TOTAL	1,917,874	2,146,166	29,582,146	33,646,186
*PATENT (2)	132	399	3,345	3,876
PATENT (3)	211,512	221,187	4,978,549	5,411,248
PATENT (4)	24,867	26,570	331,382	382,819
AGREEMENT FOREST (8)	1,349	4,413	94,519	100,281
PATENT SUB-TOTAL	237,860	252,569	5,407,795	5,898,224
INDIAN RESERVES (6)	3,708	24,810	112,023	140,541
OTHER FEDERAL (9)	35,663	1,793	205,112	242,568
FEDERAL SUB-TOTAL	39,371	26,603	317,135	383,109
TOTAL	2,195,105	2,425,338	35,307,076	39,927,519

*Patent class 2 lands are mining claims or old veteran's grants where the crown reserves the right to the timber. Patent class 3 land is the highest form of ownership, where the land owner has almost exclusive rights to all resources on a given property. Patent class 4 lands are industrial freehold lands.

The Ministry's administrative regions are shown in figure 8 and variations in land classification between regions are shown in Figure 9. Most of the productive and non-productive forest area is in the northern four regions. The non-forested area increases from the northwest to the extreme south.

Figure 8: Administrative Regions of the Ministry of Natural Resources plus the Northern Limit of Forest Resources Inventory Coverage.

Figure 9: Productive Forest Land Classification by Region.



Forest Ownership

In Ontario, the largest portions of productive forest are on Crown lands. Of the total productive forest land base, approximately 83.9% is Crown land, 15.1% is patented or private and the remaining 1.0% is federally owned (see Figure 10 and Table 2). Some Crown land is excluded from timber production in the form of recreation reserves and provincial parks. However, the total area of park land in Ontario is not excluded from timber production. Large areas in Algonquin Park and Lake Superior Park are available for timber production in accordance with the management plans in each of these parks.

For the forest resources inventory, patented lands include all lands with some form of private ownership. For example patented class 2 lands are mining claims or old veteran's grants, where the Crown retains the right to the timber. Patented class 3 land is the most common form of private ownership and patented class 4 land is industrial freehold land. For both of these classifications the landowner also owns the timber.

Although the percentage of patented land in the province as a whole is not large, its importance to timber production becomes greater and greater as you move south. The percentage of patented land rises from a low of 2.6% in Northwestern Region to a high of 96.3% in Southwestern Region (see Figure 11).

Figure 10: Ownership of Productive Forest Land.

Total Productive Area = 39.9 Million Hectares

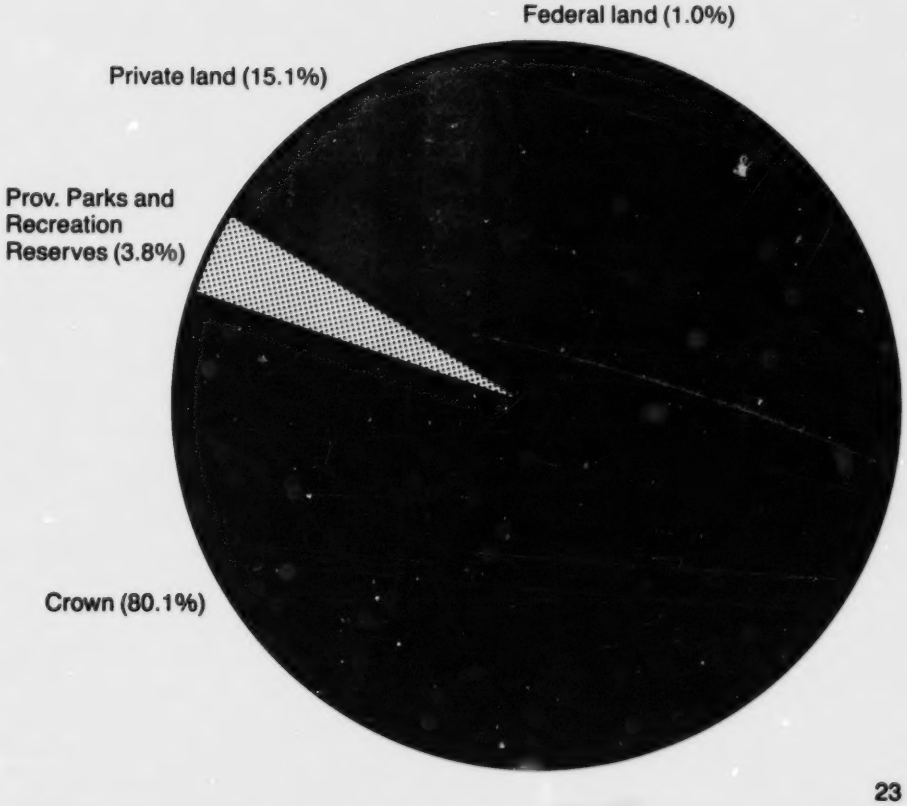


Figure 11A: Ownership of Productive Forest Land by Region – Area.

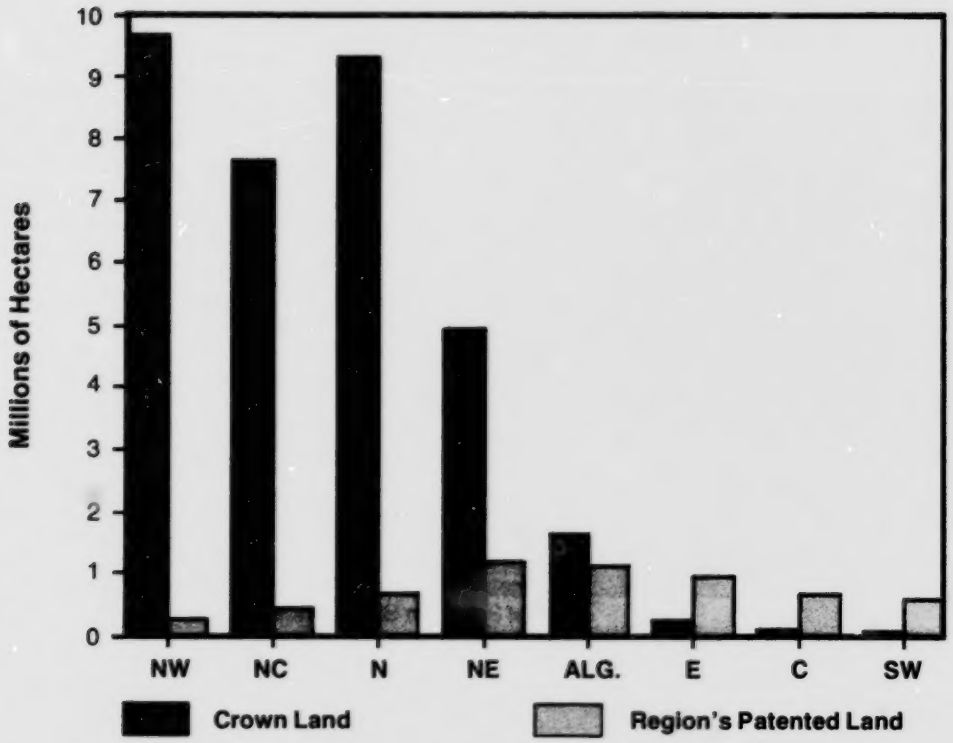
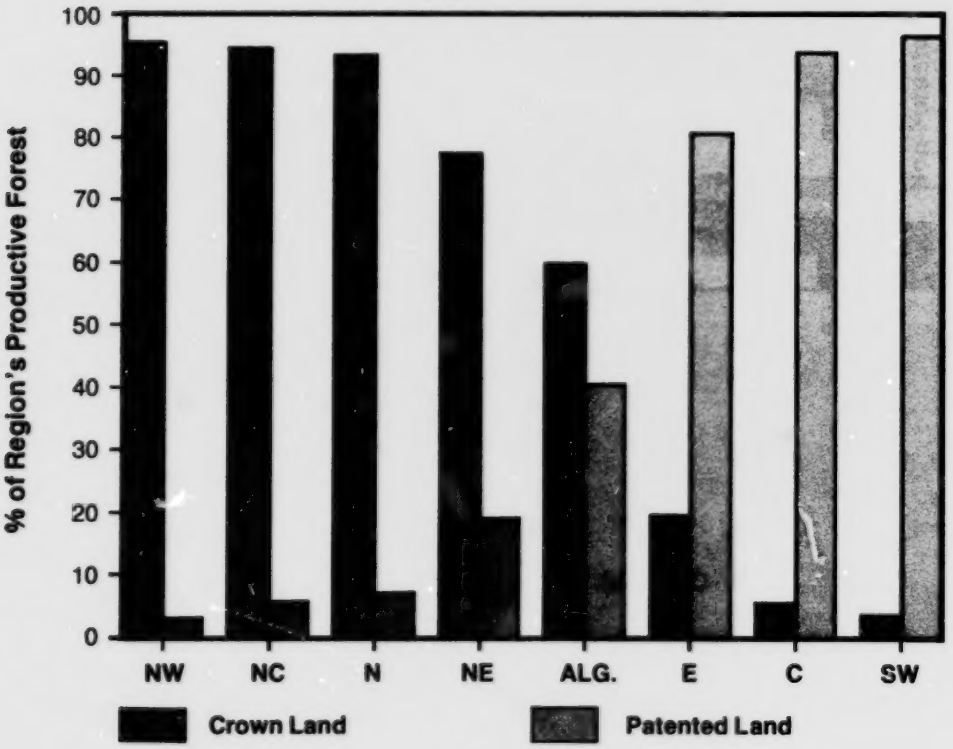


Figure 11B: Ownership of Productive Forest Land by Region – Percentages.



Forest Growing Stock

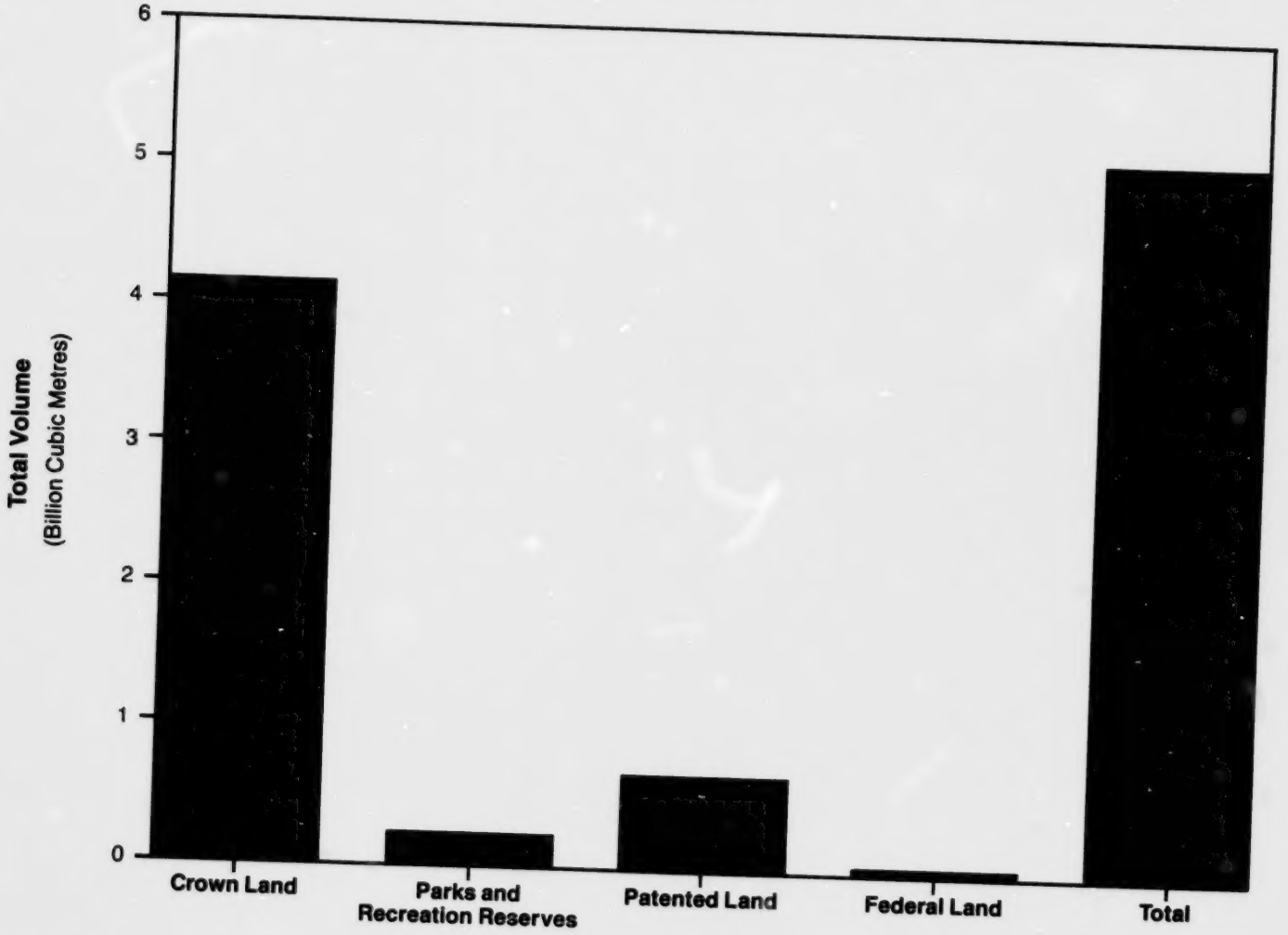
The total volume of wood in a forest is what foresters describe as total growing stock. The total growing stock volume of Ontario's forests is just over 5.1 billion cubic metres. Nearly 4.4 billion or 86% of this timber volume is on Crown land. Only 5% of this Crown land growing stock is in provincial parks. Patented lands hold an estimated 13% of the growing stock volume and federal lands hold only 1% (see Figure 12). The volumes reported are gross total volumes which include the main stem, the stump and top as well as the defective and decayed wood of the trees. Further, volumes are reported on production and production forest reserve lands only (see Table 4).

Table 4: Gross Total Volume of the Productive Forest of Ontario by Ownership (as of 1985).

(area in hectares; volume in cubic metres)

Ownership	Production Forest Reserve (Volume)	Production Forest (Volume)	Total (Volume)
CROWN (1)	235,368,370	3,940,920,216	4,176,288,586
RECREATION RESERVES (7)	3,528,253	23,733,663	27,261,916
PROVINCIAL PARKS (5)	9,006,421	180,221,424	189,227,845
CROWN SUB-TOTAL	247,903,044	4,144,875,303	4,392,778,347
PATENT (2)	38,264	563,415	601,679
PATENT (3)	20,495,695	589,299,413	609,795,108
PATENT (4)	3,767,248	42,013,211	45,780,459
AGREEMENT FOREST (8)	398,286	10,444,756	10,843,042
PATENT SUB-TOTAL	24,699,493	642,320,795	667,020,288
INDIAN RESERVES (6)	3,296,009	17,059,031	20,355,040
OTHER FEDERAL (9)	40,830	22,647,774	22,688,604
FEDERAL SUB-TOTAL	3,336,839	39,706,805	43,043,644
TOTAL	275,939,376	4,826,902,903	5,102,842,279

Figure 12: Total Growing Stock by Ownership.



Volumes of Forest Types and Working Groups

A variety of end products are produced from trees. Forest products companies require a variety of different woods from different trees to produce these products. Therefore, forest managers are very concerned with the wood volume of a desired species and where they can find it. The standard forest resources inventory ledgers tell the forester how much wood he can expect to find while forest stand maps tell him where he can find it.

White pine, red pine, jack pine, spruce, balsam fir, hemlock, and other conifer working groups are included in the softwood forest type. They form 63% or 3.2 billion cubic metres of the total growing stock volume on 66% or 24.9 million hectares of the total productive land area (see figure 13). Spruce and jack pine are the two largest working groups in this forest type. Spruce forms 63.5% or over 2 billion cubic metres (see figure 14) of the softwood growing stock volume or 40% of the total growing stock volume while jack pine forms 12.8% of the total and 20.2% of the softwood growing stock. The spruce working group includes both black and white spruce even though stand maps distinguish between the two species. Black spruce is also Ontario's most important commercial species, having the best wood characteristics for making paper. Balsam fir, other conifer, white pine, red pine, and hemlock working groups make up 7.7, 3.7, 3.5, 0.7, and 0.7 per cent of the softwood growing stock respectively.

Poplar and white birch form the intolerant hardwood group which makes up over 1.3 million cubic metres or 27% of the total growing stock volume (see Figure 13). Poplar in particular is a species which is being used in increasingly large amounts by the pulp industry as well as in the plywood and waferboard industry.

Poplar forms just over one billion cubic metres (see Figure 14) or 73% of the intolerant growing stock volume or 19.8% of the total growing stock. The poplar working group includes trembling aspen, largetooth aspen, balsam poplar, and eastern cottonwood. White birch forms 7.2% of the total growing stock.

The tolerant hardwood forest type is composed of the hard maple, yellow birch, and other hardwood working groups. There are just over 500 million cubic metres of tolerant hardwoods in the province which accounts for almost 10% of the total growing stock (see Figure 13). Hard maple is by far the most important species in terms of quantity, forming over 380 million cubic metres or 77% of the tolerant hardwood forest type's total volume. Yellow birch is a more valued tree for quality veneers, but forms only 6.4% of the tolerant hardwood growing stock. Other hardwoods include less abundant species such as oak, white elm, red maple, basswood, and walnut.

Figure 13: Growing Stock Volume by Major Forest Types.

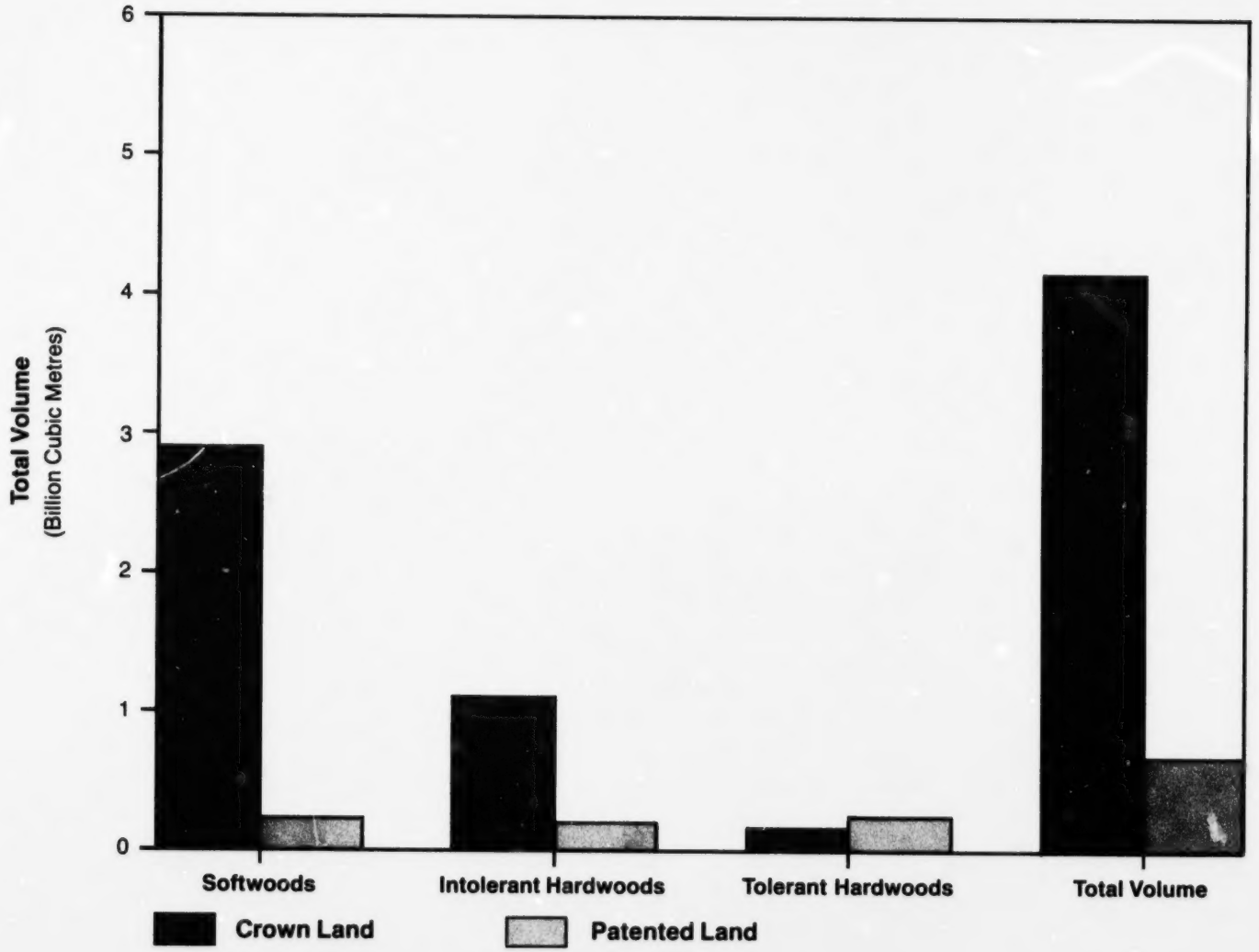
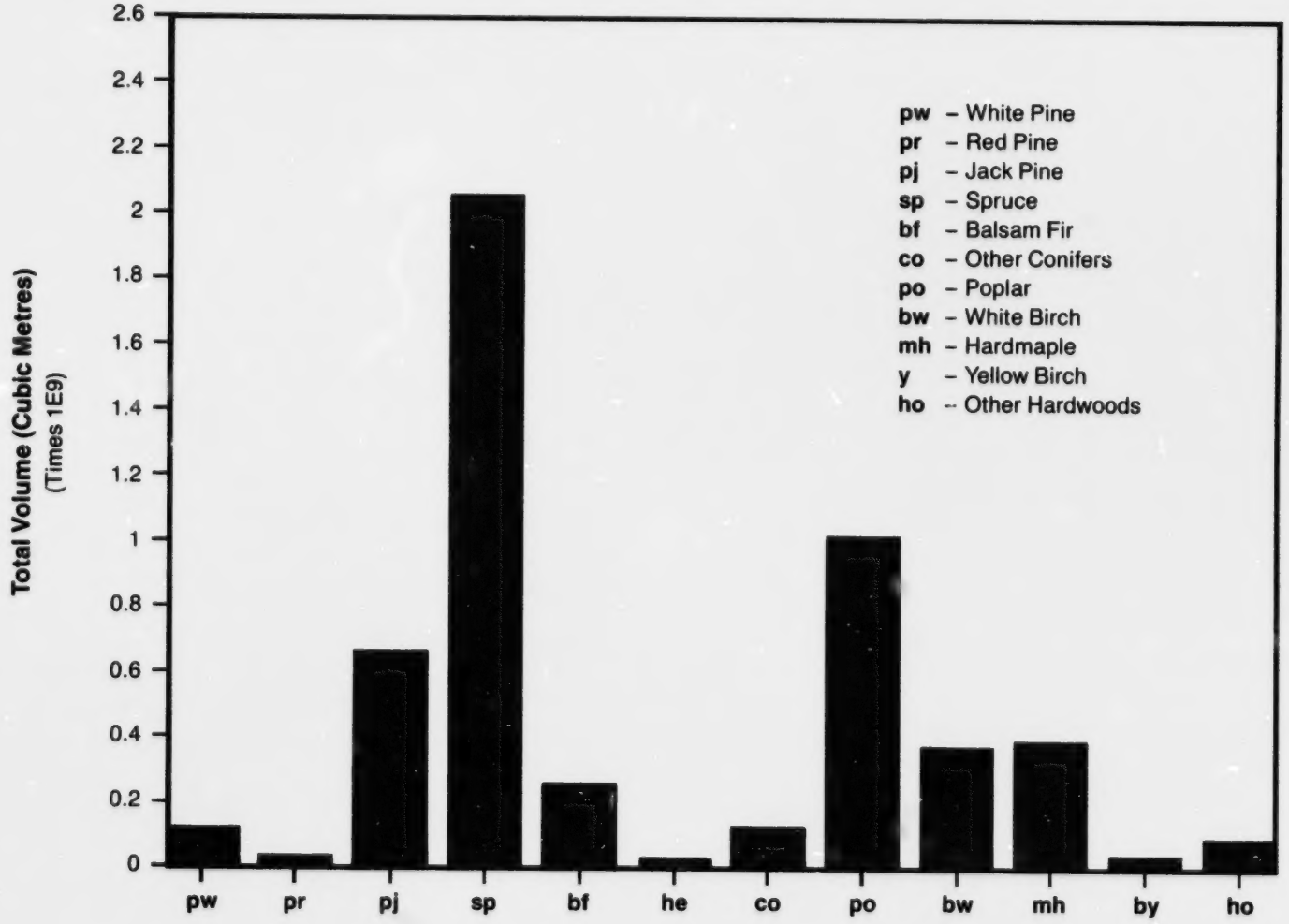


Table 5: Area and Gross Total Volume of the Provincial Production Forest by Ownership and Major Forest Types (as of 1985).

(area in hectares; volume in cubic metres)

Ownership	Softwoods		Intolerant Hardwoods		Tolerant Hardwoods		Total	
	Area	Volume	Area	Volume	Area	Volume	Area	Volume
CROWN (1)	22,180,831	2,895,881,928	7,023,050	1,109,039,523	1,180,350	171,367,135	30,384,231	4,176,288,586
RECREATION RESERVES (7)	62,503	10,425,203	34,946	6,500,262	59,446	10,336,451	156,895	27,261,916
PROVINCIAL PARKS (5)	536,976	83,332,413	298,017	46,277,569	352,193	59,617,863	1,187,186	189,227,845
CROWN SUB-TOTAL	22,780,310	2,989,639,544	7,356,013	1,161,817,354	1,591,989	241,321,449	31,728,312	4,392,778,347
PATENT (2)	1,015	164,071	2,685	430,095	44	7,513	3,744	601,679
PATENT (3)	1,764,888	192,386,396	1,358,355	174,096,520	2,076,493	243,312,192	5,199,736	609,795,108
PATENT (4)	173,154	19,342,849	140,055	17,504,121	44,743	8,933,489	357,952	45,780,459
AGREEMENT FOREST (8)	48,347	5,056,061	15,711	1,892,670	34,874	3,894,311	98,932	10,843,042
PATENT SUB-TOTAL	1,987,404	216,949,377	1,516,806	193,923,406	2,156,154	256,147,505	5,660,364	667,020,288
INDIAN RESERVES (6)	73,061	9,349,465	48,212	8,279,464	15,560	2,726,111	136,833	20,355,040
OTHERS FEDERAL (9)	69,475	9,031,010	132,394	13,174,602	5,036	482,992	206,905	22,688,604
FEDERAL SUB-TOTAL	142,536	18,380,475	180,606	21,454,066	20,596	3,209,103	343,738	43,043,644
TOTAL	24,910,250	3,224,969,396	9,053,425	1,377,194,826	3,768,739	500,678,057	37,732,414	5,102,842,279

Figure 14: Growing Stock Volume by Working Group for Ontario.



It follows from the discussion of forest regions that there would be important regional differences in the occurrence of forest types and working groups. The softwood forest type occurs proportionately more in the northern regions and decreases in abundance in the southern regions. The tolerant hardwood working group increases in importance in the southern regions as you move into the Great Lakes-St. Lawrence and deciduous forest regions (see Figure 15). Figure 15 also shows that most of the growing stock is found in the northern regions where there is a larger forest land base (Figure 8).

These regional differences are also shown at the working group level in Figures 16 to 19. The percentage of jack pine, spruce, and balsam fir decreases as you move from the northern regions to the southern regions. However, white pine, red pine, hemlock, hard maple, and yellow birch working groups are almost nonexistent in the three northernmost regions and their frequency increases in the southern regions. White pine occurs most frequently in Algonquin and Eastern Regions and yellow birch in Northeastern and Algonquin Regions. The occurrence of both the other conifer and other hardwood working groups increases in the southern regions, reflecting the richer diversity of species in the Great Lakes-St. Lawrence and deciduous forest regions.

Figure 15: Growing Stock Volume by Major Forest Types and Regions.

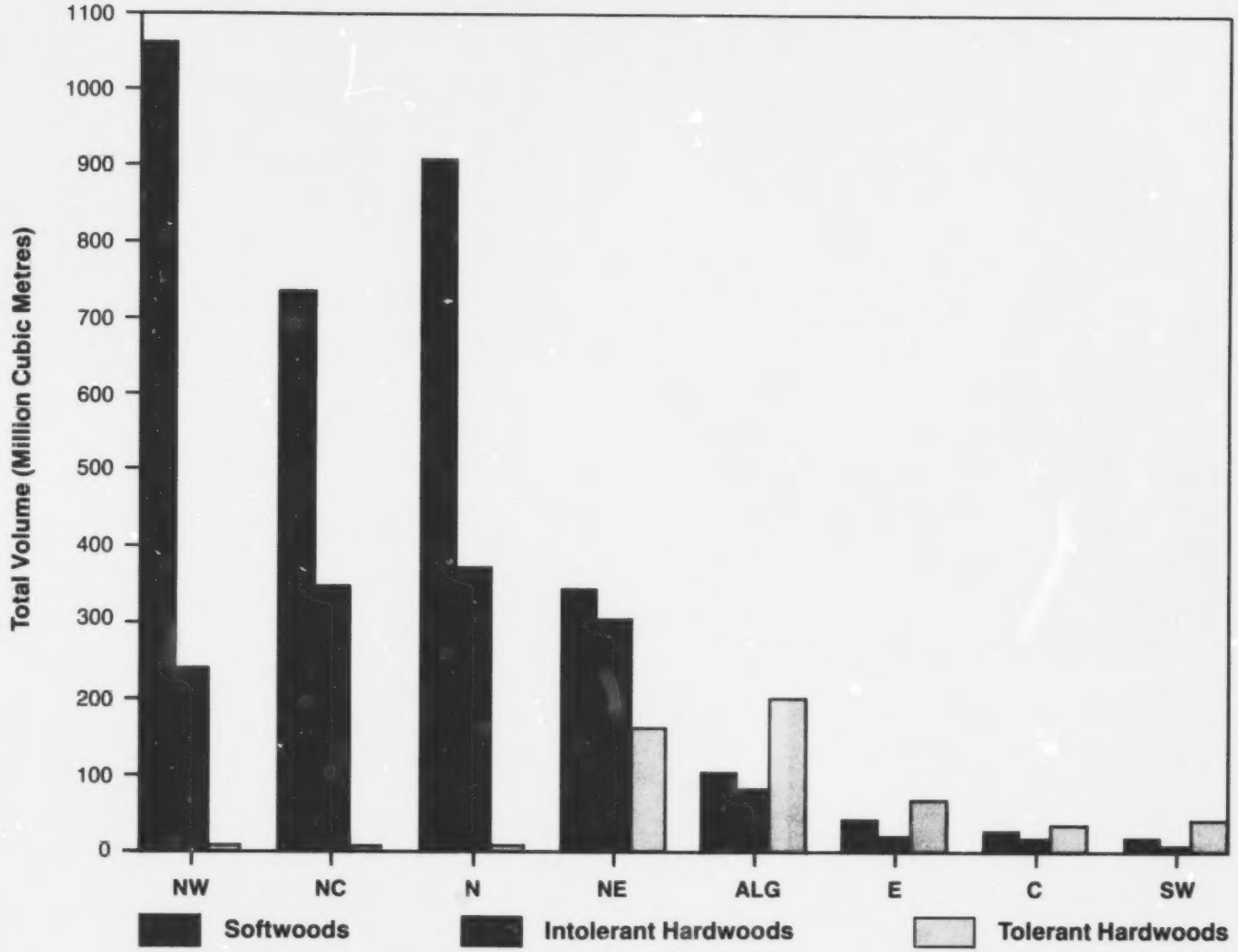


Figure 16: Growing Stock Volume of Pj, Sb, and He by Region - Percentages.

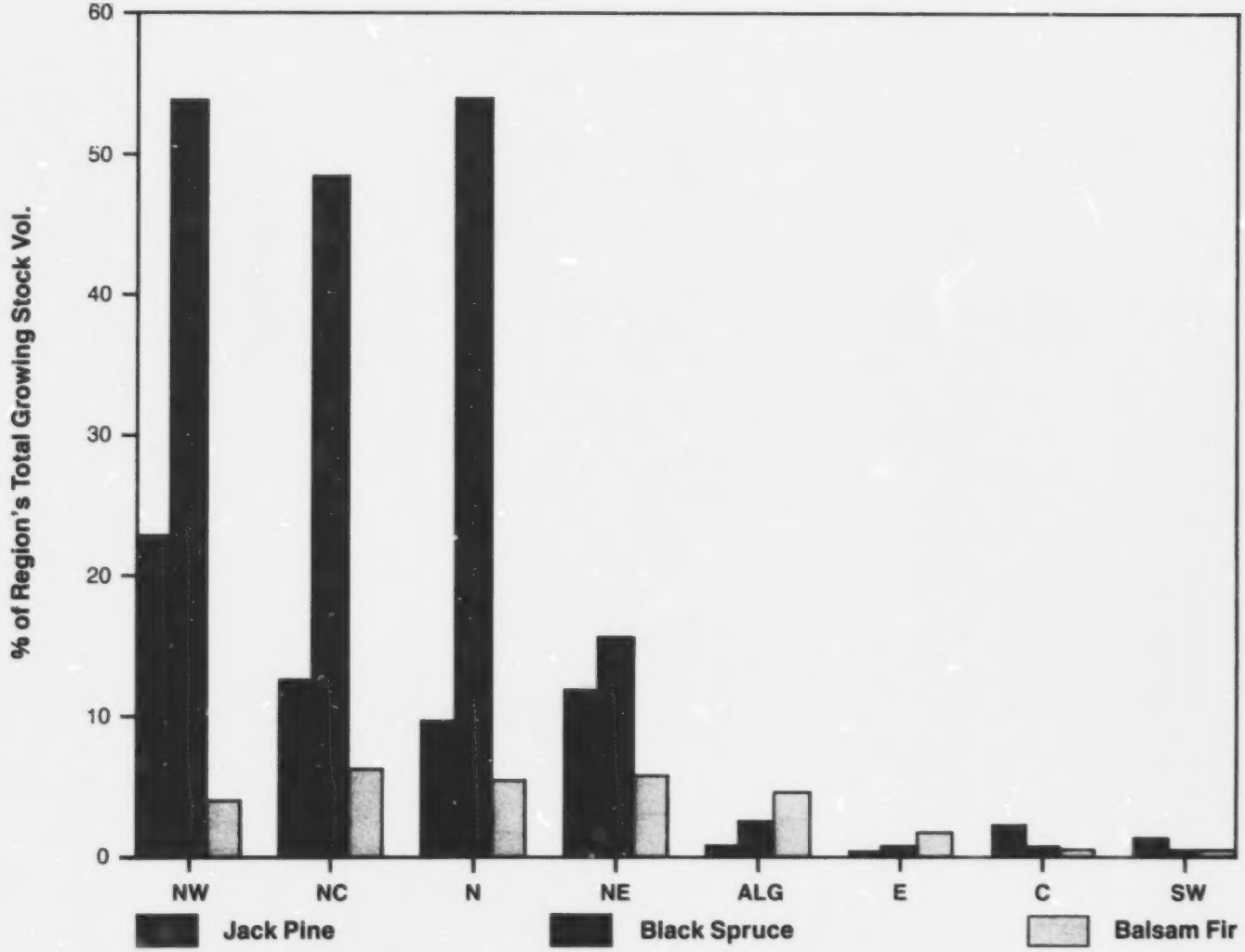


Figure 17: Growing Stock Volume of Pw, Pr, and He by Region - Percentages.

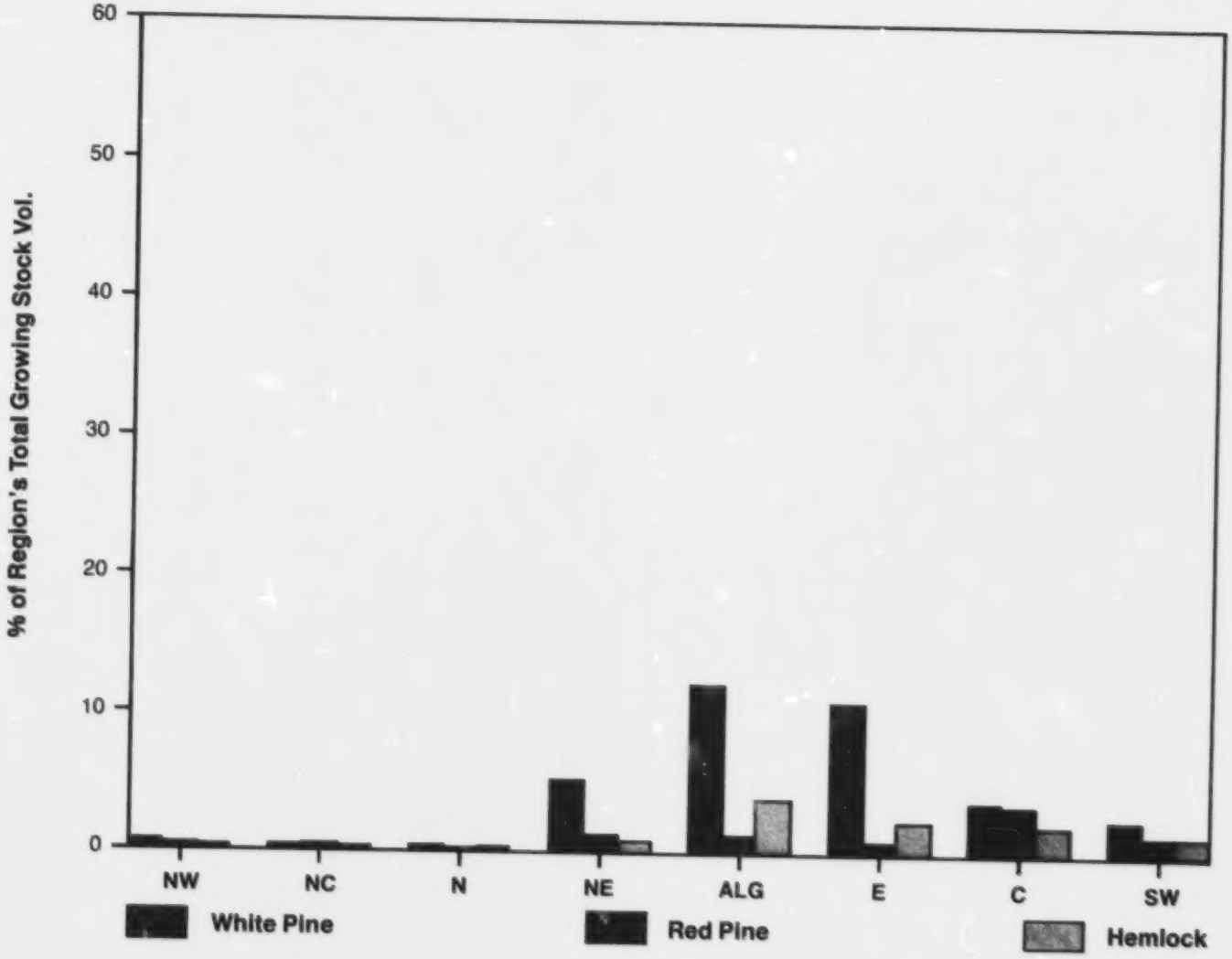


Figure 18: Growing Stock Volume of Po, Bw, and OC by Region - Percentages.

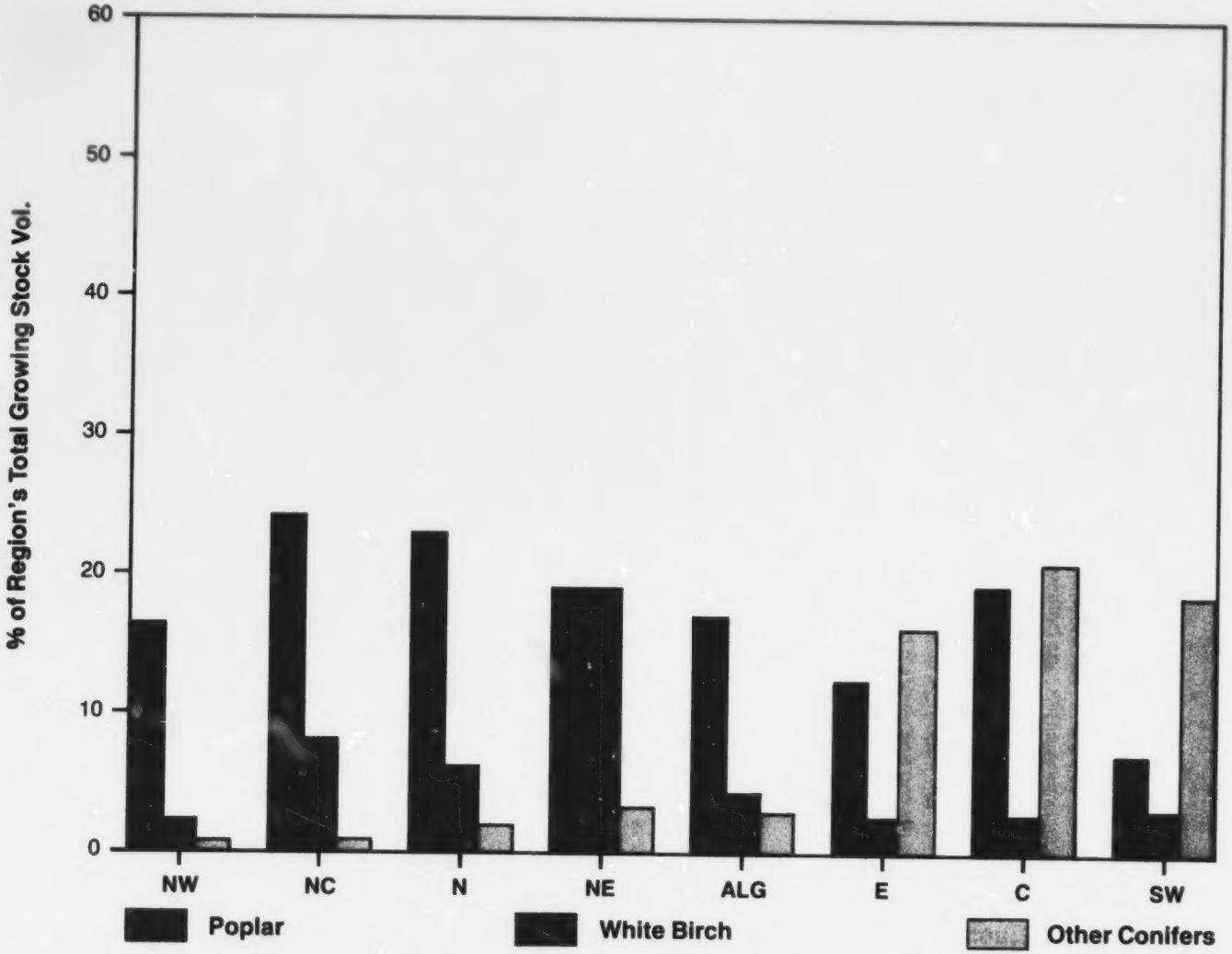
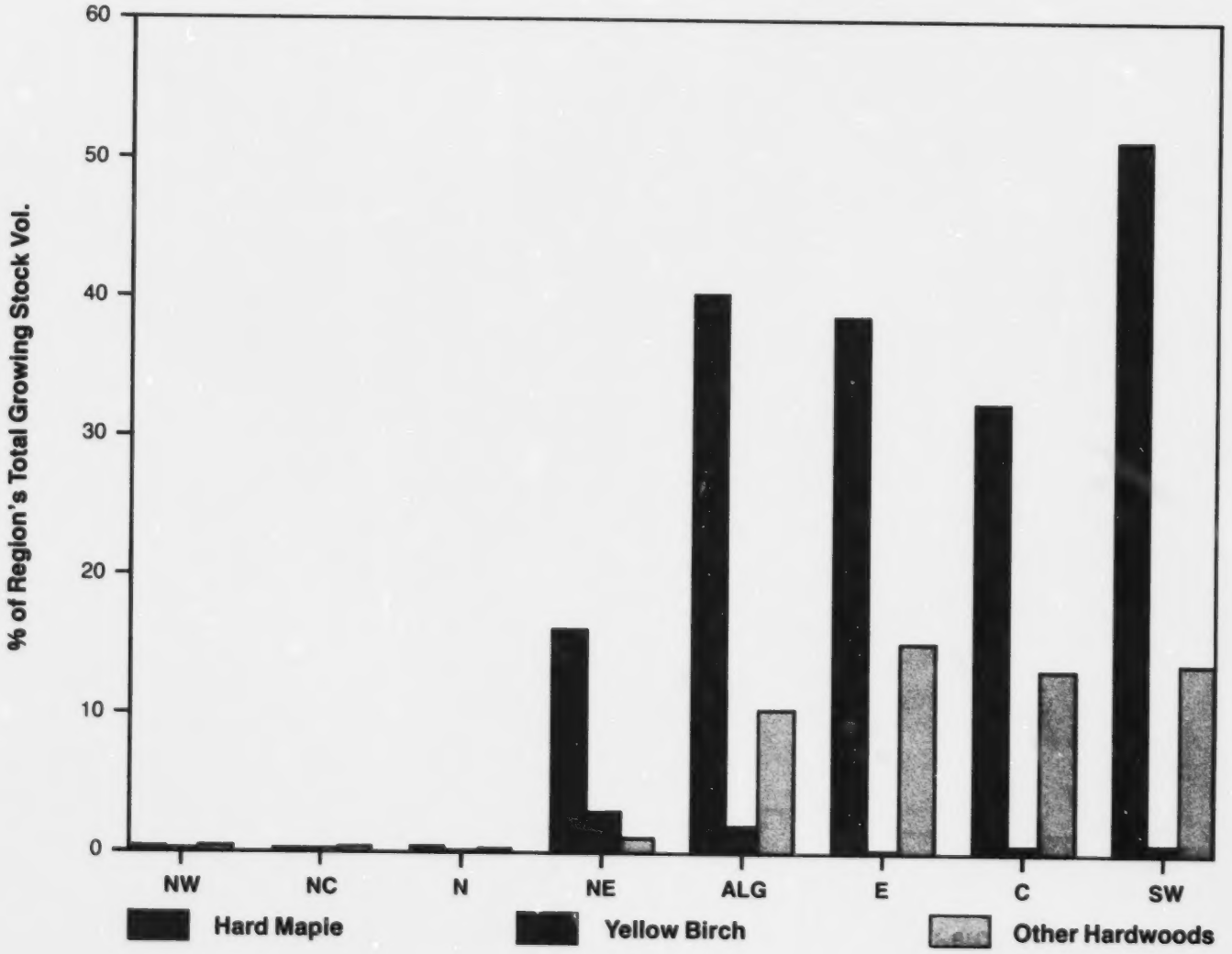


Figure 19: Growing Stock Volume of Mh, By, and OH by Region - Percentages.

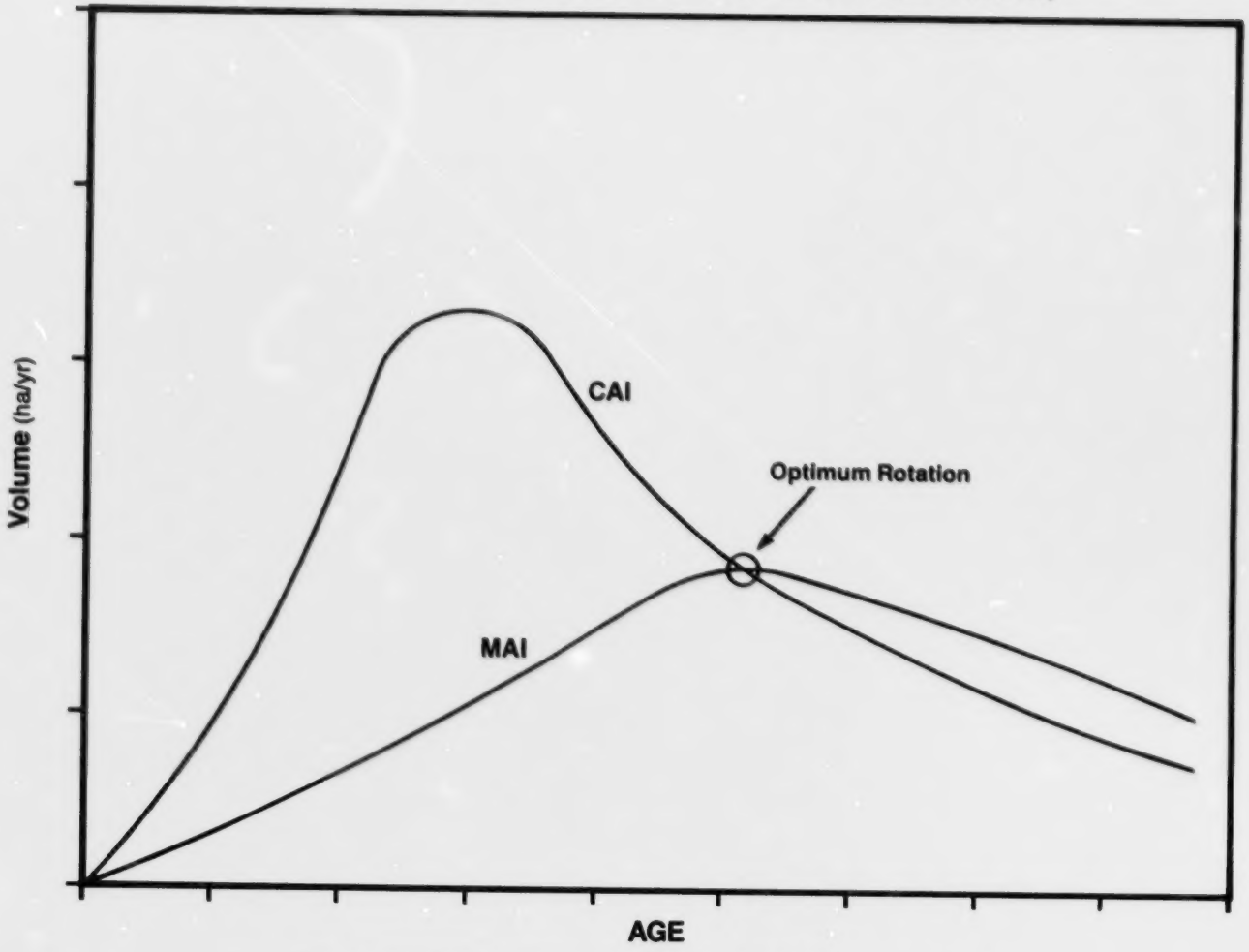


Age Classes

Stand age is an important criterion for deciding which stands to harvest and when to do so. Yield tables contain important information pertaining to the timing of stand harvests. Current annual increment (cai) is the amount stands are expected to grow in volume in one year at a specified age. Mean annual increment (mai) is the average growth per year over the entire stand's life. In Figure 20 current annual increment rises to a peak and then falls below mean annual increment and in older stands current annual increment may even become negative. As long as current annual increment is greater than mean annual increment the amount the stand grows in a year is greater than the average growth rate over the entire life of the stand. The intersection of these two curves (see Figure 20) represents the optimal biological harvesting age, or rotation age, where the fully-stocked stand achieves its maximum productivity in terms of volume growth.

There are a number of reasons why timber often is not harvested at the biological optimum. For financial reasons timber often is harvested later than the biological optimum to produce sawlogs or earlier if size is not important, as for pulpwood. The natural forest rarely presents itself for harvest in an ideal state. Much of the growing stock in Ontario for example, is already either at the optimal rotation ages or older. And both disease and pest factors can affect harvesting decisions. Generally, however, the forest manager would like to harvest timber at rotation age and let younger timber grow until it reaches rotation age.

Figure 20: The Biological Optimum.
(Intersection of Current Annual Increment and Mean Annual Increment Curves)

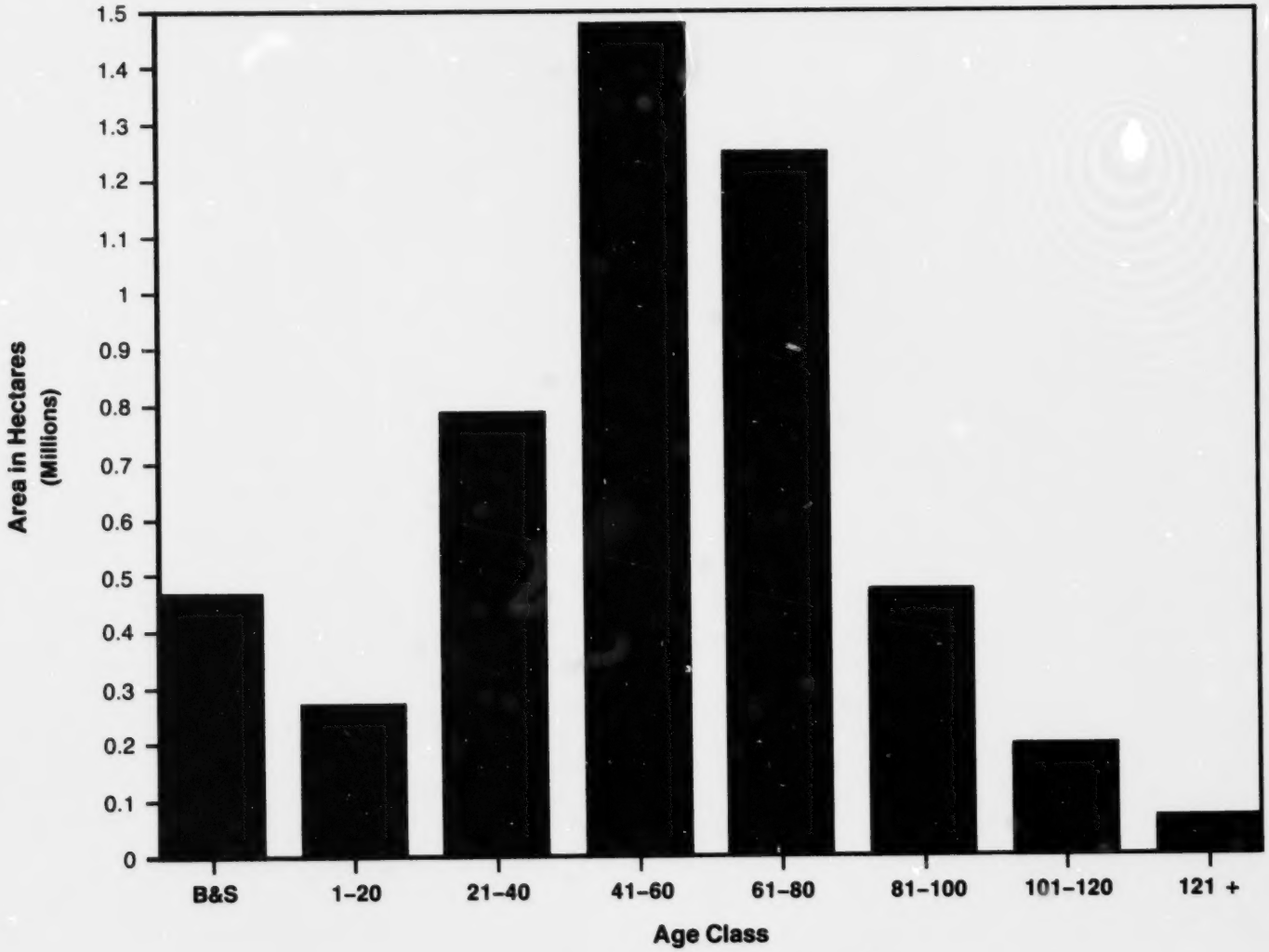


The diagrammatic patterns of CAI/ha and MAI/ha growth in volume of a forest stand.

The forest resources inventory defines five-year age classes and maps are labelled with 20-year age classes. This information provides assistance to forest managers when they allocate the cut to stands at rotation age or older. Figures 21, 22 and 23 show the age class distributions for jack pine, poplar, and black spruce (also see Table 6). Looking at the age class distribution of jack pine, while noting the optimal rotation ages of 45 to 70 years, confirms that much of the growing stock is at rotation age or older. The distribution of the poplar growing stock is also skewed towards the mature classes and the overmature age class structure is prominent in the spruce working group, which may have rotations of 75 to 100 years or more.

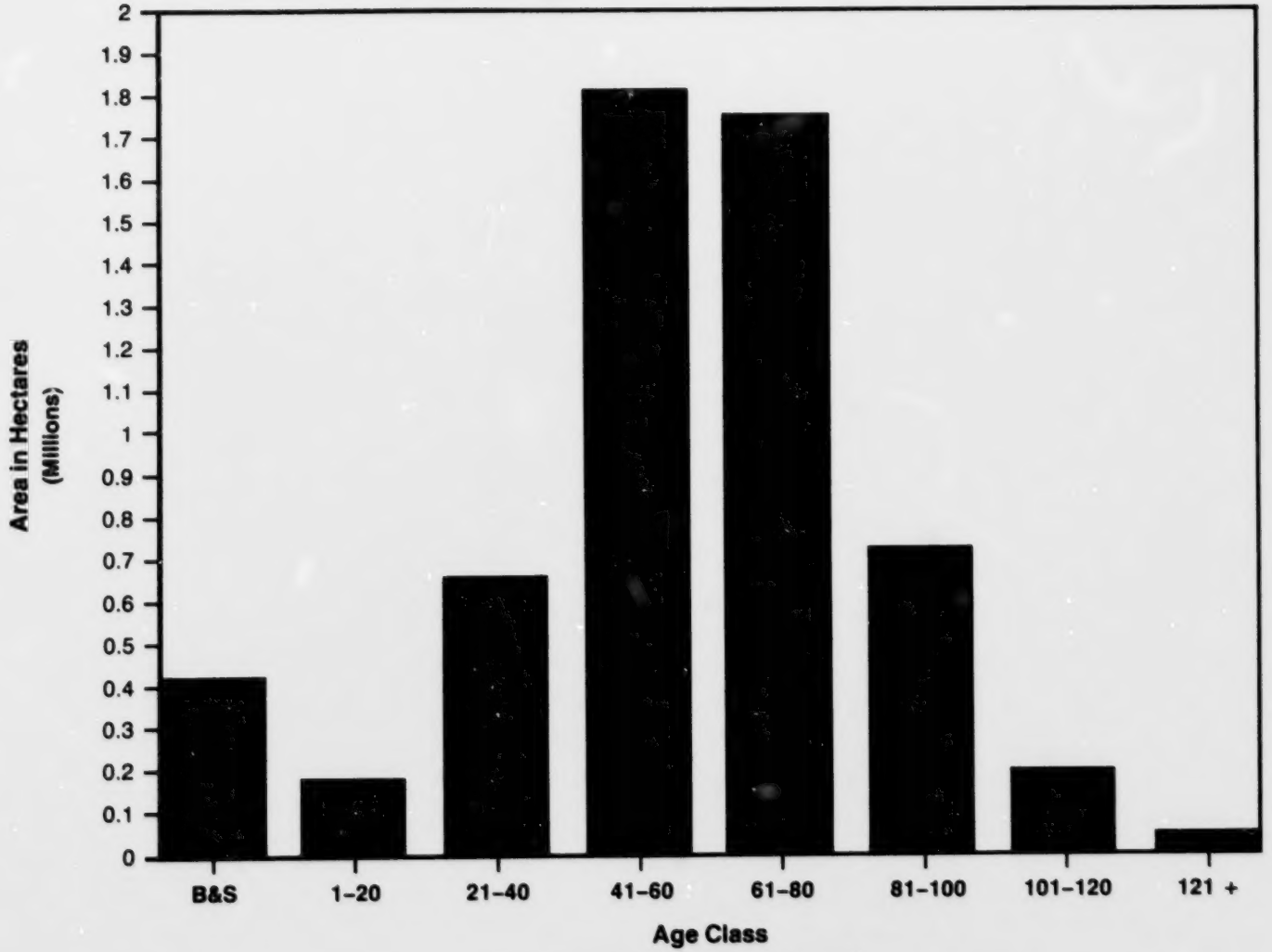
It is important to note that the age class distributions presented here are for the province as a whole and that important differences will occur at management unit, district, and regional levels. Nevertheless the overmature age class distributions are characteristic and they present difficult management problems. Essentially the overmature age class structure means that wood industries will be dependent upon older timber for many years. These older forests are more susceptible to depletion by disease, insect attacks, and fire.

Figure 21: Age Class Distribution of Jack Pine Working Group in Ontario.



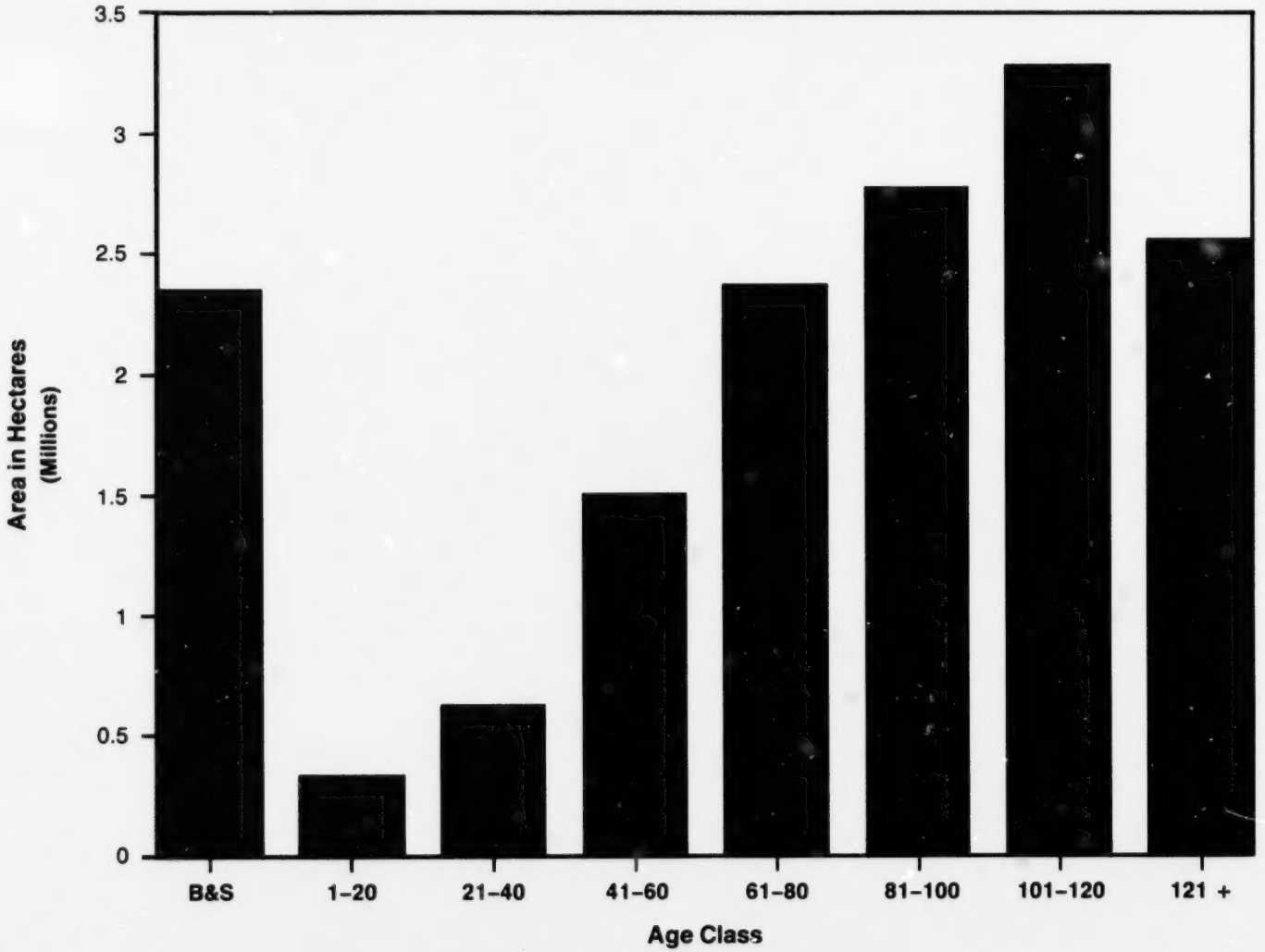
Jack Pine has a 45 to 70 year rotation.

Figure 22: Age Class Distribution of Poplar Working Group in Ontario.



Poplar has a 55 to 65 year rotation.

Figure 23: Age Class Distribution of Spruce Working Group in Ontario.



Spruce has a 75 to 100 + year rotation.

Table 6: Area and Gross Total Volume (GTV) for the Provincial Production Forest plus Production Forest Reserve by Working Group and Age Class (as of 1985).

(area in hectares; gross total volume in cubic metres)

Ownership: All

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
WHITE PINE									
AREA	59,409	16,966	21,192	50,251	153,466	204,889	54,634	98,499	659,306
GTV	——	267,510	2,473,774	8,477,675	29,929,035	39,424,456	10,607,326	20,533,100	111,712,876
RED PINE									
AREA	24,446	34,310	25,838	19,818	30,643	28,803	7,282	11,782	182,922
GTV	——	558,398	2,920,452	3,244,983	5,870,357	5,820,213	1,340,966	2,402,181	22,157,550
JACK PINE									
AREA	466,740	271,716	788,334	1,477,245	1,246,077	473,478	195,962	67,201	4,986,753
GTV	——	6,955,766	79,391,898	215,351,826	220,284,219	85,949,412	33,854,033	11,190,218	652,977,372
SPRUCE									
AREA	2,349,819	324,137	620,474	1,502,083	2,370,361	2,773,766	3,283,325	2,560,109	15,784,074
GTV	——	3,000,311	36,150,408	173,116,658	369,555,015	465,127,786	573,733,334	428,137,307	2,048,820,819
BALSAM FIR									
AREA	72,660	104,007	619,050	747,603	423,806	130,306	38,819	13,984	2,150,235
GTV	——	1,753,992	51,799,324	98,995,036	66,159,261	21,135,828	6,583,316	2,148,121	248,574,878
HEMLOCK									
AREA	1,439	89	894	6,460	15,379	19,063	13,445	68,422	125,191
GTV	——	3,775	83,511	814,704	2,512,335	3,368,737	2,319,110	13,454,491	22,556,663
OTHER CONIFERS									
AREA	181,886	4,458	21,446	185,367	232,320	114,172	127,632	154,488	1,021,769
GTV	——	63,339	1,847,026	22,036,083	32,507,300	16,924,140	19,798,647	24,992,709	118,169,244
SOFTWOODS									
AREA	3,156,399	755,683	2,097,228	3,988,827	4,472,052	3,744,477	3,721,099	2,974,485	24,910,250
GTV	——	12,603,091	174,666,393	522,036,965	726,817,522	637,750,572	648,236,732	502,858,127	3,224,969,402

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
POPLAR									
AREA	421,267	178,268	658,152	1,813,365	1,754,368	721,092	193,842	46,792	5,787,146
GTV	—	4,481,561	75,647,636	323,537,258	388,819,449	164,718,971	43,612,719	10,382,462	1,011,200,056
WHITE BIRCH									
AREA	160,181	54,205	488,268	806,654	926,001	554,198	193,028	83,744	3,266,279
GTV	—	1,396,354	37,701,670	99,522,587	123,276,122	71,531,736	22,781,023	9,785,293	365,994,785
INTOLERANT HARDWOODS									
AREA	581,448	232,473	1,146,420	2,620,019	2,680,369	1,275,290	386,870	130,536	9,053,425
GTV	—	5,877,915	113,349,306	423,059,845	512,095,571	236,250,707	66,393,742	20,167,755	1,377,194,841
HARD MAPLE									
AREA	210,071	41,830	168,677	549,737	496,483	327,978	276,194	689,775	2,760,745
GTV	—	352,552	13,126,731	62,984,301	72,697,704	52,840,045	48,783,966	134,142,100	384,927,399
YELLOW BIRCH									
AREA	2,583	808	3,975	6,321	7,273	11,125	13,814	142,210	188,109
GTV	—	6,816	259,642	653,950	985,988	1,574,715	2,275,199	26,437,670	32,193,980
OTHER HARDWOODS									
AREA	125,743	8,222	76,856	204,208	224,012	109,296	42,840	28,708	819,885
GTV	—	142,746	5,355,068	21,575,423	28,608,467	15,738,220	6,887,099	5,249,650	83,556,673
TOLERANT HARDWOODS									
AREA	338,397	50,860	249,508	760,266	727,768	448,399	332,848	860,693	3,768,739
GTV	—	502,114	18,741,441	85,213,674	102,292,159	70,152,980	57,946,264	165,829,420	500,678,052
TOTAL									
AREA	**4,076,244**	**1,039,016**	**3,493,156**	**7,369,112**	**7,880,189**	**5,468,166**	**4,440,817**	**3,965,714**	**37,732,414**
GTV	—	**18,983,120**	**306,757,140**	**1,030,310,484**	**1,341,205,252**	**944,154,259**	**772,576,738**	**688,855,302**	**5,102,842,295**

Maximum Allowable Depletion

At the management unit level, forest resources inventory data are used to calculate Maximum Allowable Depletion (MAD). MAD is the amount of area from which timber may be depleted over a five-year term of a timber management plan by any means, including harvesting, fire, insects, disease, or because of the allocation of area to other uses to fulfil the objectives of management. One of the objectives of management is to produce and maintain a wood supply which provides for an optimum continuous contribution to the economy by the wood-utilizing industry. The optimum level of continuous timber production in even-aged management is obtained from a forest where areas in equiproductive age classes are in approximate balance up to a specified rotation age. This forest is known as the regulated forest and it represents the Ministry's long term target age class distribution.

Maximum Allowable Depletion replaces the regulatory measure known as Annual Allowable Cut (AAC). The terminology was changed because the former definition implied that the calculated amount of allowable depletion was available entirely for harvest. This term is no longer used because the forest also is depleted annually by fire, insects, and disease and losses due to the allocation of forests to other uses where harvesting is not permitted.

The Future of The Forest Resources Inventory

Forest inventories are created using a variety of techniques which are suited to specific end uses. Ontario's forest inventory is tailored for use as a forest management planning tool. The inventory has proven a suitable tool for management planning at the management unit level, but at the stand level the inventory should be supplemented with operational cruises. The inventory also has been shown to be less than ideal for tracking changes in the forest, whether depletions from fire, insects, disease, or to harvesting or accruals from successful regeneration. However, major changes are being adopted by Ontario that will enhance the accuracy of the forest inventory, its flexibility, and its utility to forest management planners.

One of the more recent changes was the introduction of the Forest Resources Inventory Data Entry System (FRIDES). This new computer software allows field personnel to update FRI stand data based on operational cruise data. In the future there will be increased use of large-scale photography which will reduce costs and provide measures of statistical precision. Changes will also occur in the way FRI data are stored on computers. FRI data will be stored in digital form which will allow for the use of digital mapping systems. These computerized mapping systems will make compilation and map drafting as well as interfacing with FRI data easier, providing versatility and more direct assistance to forest management planners. Finally, there will be an increased use of remote sensing which will be very useful for keeping track of changes that occur in the forests due to disturbances such as logging, fires, and mortality caused by insects and disease.

These improvements will make the inventory more up to date and more useful at the stand level, and will provide a better basis for management planning and future wood supply modelling.

Appendix A:

Regional Summary Tables

Note, numbers in the tables may not add exactly because of rounding errors.

Table 7: Major Classifications of the Northwestern Region Covered by the Forest Resources Inventory (as of 1985).

(hectares)

Ownership	Water	Non-Forested	Non-Productive	Productive	Total
CROWN (1)	2,046,720	31,402	1,122,819	9,682,617	12,883,558
RECREATION RESERVES (7)	0	6	0	0	6
PROVINCIAL PARKS (5)	29,642	165	16,856	136,185	182,848
CROWN SUB-TOTAL	2,076,362	31,573	1,139,675	9,818,802	13,066,412
PATENT (2)	0	0	0	0	0
PATENT (3)	7	79,265	47,474	251,794	378,540
PATENT (4)	0	396	1,624	17,382	19,402
AGREEMENT FOREST (8)	0	0	0	0	0
PATENT SUB-TOTAL	7	79,661	49,098	269,176	397,942
INDIAN RESERVES (6)	460	9,417	12,322	94,114	116,313
OTHER FEDERAL (9)	387,592	20,806	475,663	8,849	892,910
FEDERAL SUB-TOTAL	388,052	30,223	487,985	102,963	1,009,223
TOTAL	2,464,421	141,457	1,676,758	10,190,941	14,473,577

Table 8: Area and Gross Total Volume of the Productive Forest of the Northwestern Region by Ownership (as of 1985).

(area in hectares; volume in cubic metres)

Ownership		Protection Forest (Area)	Protection Forest Reserve (Area)	Production Forest (Area)	Total (Area)	Protection Forest Reserve (Volume)	Production Forest (Volume)	Total (Volume)
CROWN	(1)	376,067	1,150,806	8,155,744	9,682,617	124,663,113	1,110,346,832	1,235,009,945
RECREATION RESERVES	(7)	0	0	0	0	0	0	0
PROVINCIAL PARKS	(5)	7,077	42,944	86,164	136,185	5,296,603	15,570,744	20,867,347
CROWN SUB-TOTAL		383,144	1,193,750	8,241,908	9,818,802	129,959,716	1,125,917,576	1,255,877,292
PATENT	(2)	0	0	0	0	0	0	0
PATENT	(3)	5,978	44,459	201,357	251,794	4,756,202	24,581,934	29,338,136
PATENT	(4)	25	610	16,747	17,382	87,180	2,798,910	2,886,090
AGREEMENT FOREST	(8)	0	0	0	0	0	0	0
PATENT SUB-TOTAL		6,003	45,069	218,104	269,176	4,843,382	27,380,844	32,224,226
INDIAN RESERVES	(6)	2,241	23,577	68,296	94,114	3,139,046	10,285,027	13,424,073
OTHER FEDERAL	(9)	323	167	8,359	8,849	7,098	1,058,082	1,065,180
FEDERAL SUB-TOTAL		2,564	23,744	76,655	102,963	3,146,144	11,343,109	14,489,253
TOTAL		391,711	1,262,563	8,536,667	10,190,941	137,949,242	1,164,641,529	1,302,590,771

Table 9: Area and Gross Total Volume of the Northwestern Region Production Forest by Ownership and Major Forest Types (as of 1985).

(area in hectares; volume in cubic metres)

Ownership	Softwoods		Intolerant Hardwoods		Tolerant Hardwoods		Total	
	Area	Volume	Area	Volume	Area	Volume	Area	Volume
CROWN (1)	8,114,341	1,023,031,522	1,183,015	210,957,572	9,194	1,020,851	9,306,550	1,235,009,945
RECREATION RESERVES (7)	0	0	0	0	0	0	0	0
PROVINCIAL PARKS (5)	118,666	18,746,891	8,930	1,891,575	1,512	228,881	129,108	20,867,347
CROWN SUB-TOTAL	8,233,007	1,041,778,413	1,191,945	212,849,147	10,706	1,249,732	9,435,658	1,255,877,292
PATENT (2)	0	0	0	0	0	0	0	0
PATENT (3)	102,299	10,129,433	135,270	18,458,807	8,247	749,896	245,816	29,338,136
PATENT (4)	14,405	2,366,798	2,952	519,292	0	0	17,357	2,886,090
AGREEMENT FOREST (8)	0	0	0	0	0	0	0	0
PATENT SUB-TOTAL	116,704	12,496,231	138,222	18,978,099	8,247	749,896	263,173	32,224,226
INDIAN RESERVES (6)	56,890	7,231,197	33,184	5,918,224	1,799	274,652	91,873	13,424,073
OTHER FEDERAL (9)	1,172	119,828	6,742	870,255	612	75,097	8,526	1,065,180
FEDERAL SUB-TOTAL	58,062	7,351,025	39,926	6,788,479	2,411	349,749	100,399	14,489,253
TOTAL	8,407,773	1,061,625,669	1,370,093	238,615,725	21,364	2,349,377	9,799,230	1,302,590,771

Table 10: Area and Gross Total Volume (GTV) of the Northwestern Region Production Forest plus Production Forest Reserve by Working Group and Age Class (as of 1985).

(area in hectares; gross total volume in cubic metres)

Ownership: All

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
WHITE PINE									
AREA	775	35	100	2,253	5,975	4,925	3,183	6,103	23,349
GTV	——	351	11,474	300,774	959,930	862,116	657,888	1,410,479	4,203,012
RED PINE									
AREA	1,551	198	436	3,670	4,298	3,504	1,569	1,287	16,513
GTV	——	7,663	37,421	750,197	943,067	678,328	278,672	247,294	2,942,642
JACK PINE									
AREA	305,494	153,316	265,225	733,220	609,248	200,327	111,387	46,394	2,424,611
GTV	——	4,426,473	25,132,620	102,493,247	102,857,608	34,284,977	19,271,052	7,768,209	296,234,186
SPRUCE									
AREA	778,545	133,151	203,875	624,299	994,951	1,033,974	954,572	683,006	5,406,373
GTV	——	1,012,911	12,215,716	77,936,471	157,003,706	171,546,991	165,934,036	114,197,847	699,847,678
BALSAM FIR									
AREA	7,973	21,335	230,004	172,522	35,294	7,828	4,281	3,018	482,255
GTV	——	564,505	18,994,644	23,348,011	5,847,255	1,233,770	626,237	399,756	51,014,178
HEMLOCK									
AREA									0
GTV	——								0
OTHER CONIFERS									
AREA	3,962	37	1,259	4,969	9,229	12,917	12,890	9,409	54,672
GTV	——	979	105,636	596,036	1,220,472	1,896,299	2,030,135	1,534,421	7,383,978
SOFTWOODS									
AREA	1,098,300	308,072	700,899	1,540,933	1,658,995	1,263,475	1,087,882	749,217	8,407,773
GTV	——	6,012,882	56,497,511	205,424,736	268,832,038	210,502,481	188,798,020	125,558,006	1,061,625,674

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
POPLAR									
AREA	68,487	36,459	137,605	396,161	350,221	109,584	27,911	16,208	1,142,636
GTV	——	871,669	19,346,243	75,007,909	81,100,213	24,746,504	6,184,579	3,428,102	210,685,219
WHITE BIRCH									
AREA	4,413	3,557	33,275	85,647	59,883	26,701	9,449	4,532	227,457
GTV	——	79,722	2,995,299	11,225,477	8,645,009	3,498,741	1,044,877	441,379	27,930,504
INTOLERANT HARDWOODS									
AREA	72,900	40,016	170,880	481,808	410,104	136,285	37,360	20,740	1,370,093
GTV	——	951,391	22,341,542	86,233,386	89,745,222	28,245,245	7,229,456	3,869,481	238,615,723
HARD MAPLE									
AREA			162	457	501	73	55		1,248
GTV	——		8,045	47,758	61,583	9,377	11,091		137,854
YELLOW BIRCH									
AREA	653	83	2,852	1,862	252				5,702
GTV	——	2,673	185,938	168,233	35,398				392,242
OTHER HARDWOODS									
AREA	642		730	5,759	4,606	1,907	567	203	14,414
GTV	——		55,381	609,685	654,431	339,395	115,798	44,591	1,819,281
TOLERANT HARDWOODS									
AREA	1,295	83	3,744	8,078	5,359	1,980	622	203	21,364
GTV	——	2,673	249,364	825,676	751,412	348,772	126,889	44,591	2,349,377
TOTAL									
AREA	**1,172,495**	**348,171**	**875,523**	**2,030,819**	**2,074,458**	**1,401,740**	**1,125,864**	**770,160**	**9,799,230**
GTV	——	**6,966,946**	**79,088,417**	**292,483,798**	**359,328,672**	**239,096,498**	**196,154,365**	**129,472,078**	**1,302,590,774**

Table 11: Major Classifications of the North Central Region Covered by the Forest Resources Inventory (as of 1985).

(hectares)

Ownership		Water	Non-Forested	Non-Productive	Productive	Total
CROWN	(1)	1,782,842	33,733	852,320	7,401,498	10,070,393
RECREATION RESERVES	(7)	0	44	107	735	886
PROVINCIAL PARKS	(5)	1,799	383	744	260,320	263,246
CROWN SUB-TOTAL		1,784,641	34,160	853,171	7,662,553	10,334,525
PATENT	(2)	0	42	13	93	148
PATENT	(3)	2	61,535	43,869	442,366	547,772
PATENT	(4)	0	0	0	0	0
AGREEMENT FOREST	(8)	0	0	0	248	248
PATENT SUB-TOTAL		2	61,577	43,882	442,707	548,168
INDIAN RESERVES	(6)	209	5,293	1,677	16,421	23,600
OTHER FEDERAL	(9)	9	664	268	1,239	2,180
FEDERAL SUB-TOTAL		218	5,957	1,945	17,660	25,780
TOTAL		1,784,861	101,694	898,998	8,122,920	10,908,473

Table 12: Area and Gross Total Volume of the Productive Forest of North Central Region by Ownership (as of 1985).

(area in hectares; volume in cubic metres)

Ownership		Protection Forest (Area)	Protection Forest Reserve (Area)	Production Forest (Area)	Total (Area)	Protection Forest Reserve (Volume)	Production Forest (Volume)	Total (Volume)
CROWN RECREATION	(1)	297,365	457,103	6,647,030	7,401,498	52,123,547	936,102,323	988,225,870
RESERVES	(7)	0	0	735	735	0	55,730	55,730
PROVINCIAL PARKS	(5)	12,848	569	246,903	260,320	85,705	33,429,434	33,515,139
CROWN SUB-TOTAL		310,213	457,672	6,894,668	7,662,553	52,209,252	969,587,487	1,021,796,739
PATENT	(2)	0	0	93	93	0	11,891	11,891
PATENT	(3)	20,828	6,125	415,413	442,366	688,334	55,167,668	55,856,002
PATENT	(4)	0	0	0	0	0	0	0
AGREEMENT FOREST	(8)	0	0	248	248	0	20,357	20,357
PATENT SUB-TOTAL		20,828	6,125	415,754	442,707	688,334	55,199,916	55,888,250
INDIAN RESERVES	(6)	559	1,219	14,643	16,421	156,963	2,453,884	2,610,847
OTHER FEDERAL	(9)	39	142	1,058	1,239	16,687	90,840	107,527
FEDERAL SUB-TOTAL		598	1,361	15,701	17,660	173,650	2,544,724	2,718,374
TOTAL		331,639	465,158	7,326,123	8,122,920	53,071,236	1,027,332,127	1,080,403,363

Table 13: Area and Gross Total Volume of the North Central Region Production Forest by Ownership and Major Forest Types (as of 1985).

(area in hectares; volume in cubic metres)

Ownership	Softwoods		Intolerant Hardwoods		Tolerant Hardwoods		Total	
	Area	Volume	Area	Volume	Area	Volume	Area	Volume
CROWN (1)	5,304,707	689,129,225	1,798,280	298,971,975	1,146	124,670	7,104,133	988,225,870
RECREATION RESERVES (7)	408	35,248	327	20,482	0	0	735	55,730
PROVINCIAL PARKS (5)	152,428	21,353,310	94,560	12,102,731	484	59,098	247,472	33,515,139
CROWN SUB-TOTAL	5,457,543	710,517,783	1,893,167	311,095,188	1,630	183,768	7,352,340	1,021,796,739
PATENT (2)	47	6,018	46	5,873	0	0	93	11,891
PATENT (3)	189,160	22,386,560	231,297	33,352,070	1,081	117,372	421,538	55,856,002
PATENT (4)	0	0	0	0	0	0	0	0
AGREEMENT FOREST (8)	175	11,074	73	9,283	0	0	248	20,357
PATENT SUB-TOTAL	189,382	22,403,652	231,416	33,367,226	1,081	117,372	421,879	55,888,250
INDIAN RESERVES (6)	7,850	1,096,130	7,638	1,467,418	374	47,299	15,862	2,610,847
OTHER FEDERAL (9)	892	67,225	308	40,302	0	0	1,200	107,527
FEDERAL SUB-TOTAL	8,742	1,163,355	7,946	1,507,720	374	47,299	17,062	2,718,374
TOTAL	5,655,667	734,084,790	2,132,529	345,970,134	3,085	348,439	7,791,281	1,080,403,363

Table 14: Area and Gross Total Volume (GTV) for the North Central Region Production Forest plus Production Forest Reserve by Working Group and Age Class (as of 1985).

(area in hectares; gross total volume in cubic metres)

Ownership: All

Working Groups	Age Classes								
	Barren & Scattered	1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
WHITE PINE									
AREA	1,097	0	0	664	4,198	2,673	1,955	3,097	13,684
GTV	—	0	0	93,647	723,492	453,195	343,693	565,611	2,179,638
RED PINE									
AREA	409	219	403	2,783	6,097	2,306	247	1,011	13,475
GTV	—	1,783	44,020	439,713	1,158,983	458,141	60,865	229,935	2,393,440
JACK PINE									
AREA	41,000	21,352	196,556	346,685	207,735	90,708	24,083	8,297	936,416
GTV	—	547,116	20,904,647	51,600,072	38,267,720	17,761,387	4,453,531	1,289,471	134,823,944
SPRUCE									
AREA	520,443	55,854	218,133	379,495	545,360	800,132	910,277	593,359	4,023,053
GTV	—	576,852	12,757,466	41,309,759	83,641,801	134,362,061	152,546,706	97,662,577	522,857,222
BALSAM FIR									
AREA	14,038	27,589	212,353	180,740	127,867	34,822	13,878	3,918	615,205
GTV	—	635,814	15,578,929	22,141,196	18,206,391	5,243,269	2,287,908	601,534	64,695,041
HEMLOCK									
AREA									0
GTV	—								0
OTHER CONIFERS									
AREA	1,743	225	1,137	2,104	5,065	10,440	15,726	17,394	53,834
GTV	—	3,341	55,996	196,294	706,979	1,374,798	2,153,446	2,644,650	7,135,504
SOFTWOODS									
AREA	578,730	105,239	628,582	912,471	896,322	941,081	966,166	627,076	5,655,667
GTV	—	1,764,906	49,341,058	115,780,681	142,705,366	159,652,851	161,846,149	102,993,778	734,084,789

Continuation of TABLE 14

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
POPLAR									
AREA	77,868	44,115	135,377	400,560	410,102	235,928	73,130	10,584	1,387,664
GTV	—	1,239,332	15,126,578	74,055,074	95,042,753	55,286,173	16,509,164	2,254,660	259,513,734
WHITE BIRCH									
AREA	22,465	19,613	148,503	152,414	212,181	130,872	45,976	12,841	744,865
GTV	—	652,993	11,448,364	19,238,328	29,790,734	18,667,295	5,306,048	1,352,637	86,456,399
INTOLERANT HARDWOODS									
AREA	100,333	63,728	283,880	552,974	622,283	366,800	119,106	23,425	2,132,529
GTV	—	1,892,325	26,574,942	93,293,402	124,833,487	73,953,468	21,815,212	3,607,297	345,970,133
HARD MAPLE									
AREA			47	239	45	170			501
GTV	—		2,606	22,390	4,932	23,127			53,055
YELLOW BIRCH									
AREA						40		113	153
GTV	—					5,508		15,615	21,123
OTHER HARDWOODS									
AREA	115		62	494	1,036	495	120	109	2,431
GTV	—		3,545	51,969	125,434	62,882	20,462	9,970	274,262
TOLERANT HARDWOODS									
AREA	115	0	109	733	1,081	705	120	222	3,085
GTV	—	0	6,151	74,359	130,366	91,517	20,462	25,585	348,440
TOTAL									
AREA	**679,178**	**168,967**	**912,571**	**1,466,178**	**1,519,686**	**1,308,586**	**1,085,392**	**650,723**	**7,791,281**
GTV	—	**3,657,231**	**75,922,151**	**209,148,442**	**267,669,219**	**233,697,836**	**183,681,823**	**106,626,660**	**1,080,403,362**

Table 15: Major Classifications of the Northern Region Covered by the Forest Resources Inventory (as of 1985).

(hectares)

Ownership		Water	Non-Forested	Non-Productive	Productive	Total
CROWN	(1)	727,895	59,997	2,102,108	9,223,048	12,113,048
RECREATION RESERVES	(7)	0	416	4,210	29,404	34,030
PROVINCIAL PARKS	(5)	10,789	4,147	5,405	75,639	95,980
CROWN SUB-TOTAL		738,684	64,560	2,111,723	9,328,091	12,243,058
PATENT	(2)	0	0	167	1,333	1,500
PATENT	(3)	434	125,741	63,415	607,908	797,498
PATENT	(4)	0	517	15,153	74,014	89,684
AGREEMENT FOREST	(8)	0	0	0	0	0
PATENT SUB-TOTAL		434	126,258	78,735	683,255	888,682
INDIAN RESERVES	(6)	1,389	17,693	298	5,364	24,744
OTHER FEDERAL	(9)	0	0	889	101	990
FEDERAL SUB-TOTAL		1,389	17,693	1,187	5,465	25,734
TOTAL		740,507	208,511	2,191,645	10,016,811	13,157,474

Table 16: Area and Gross Total Volume of the Productive Forest of the Northern Region by Ownership (as of 1985).

(area in hectares; volume in cubic metres)

Ownership		Protection Forest (Area)	Protection Forest Reserve (Area)	Production Forest (Area)	Total (Area)	Protection Forest Reserve (Volume)	Production Forest (Volume)	Total (Volume)
CROWN RECREATION	(1)	651,375	119,962	8,451,711	9,223,048	17,203,179	1,167,820,900	1,185,024,079
RESERVES PROVINCIAL	(7)	706	0	28,698	29,404	0	5,921,639	5,921,639
PARKS	(5)	1,392	1,639	72,608	75,639	271,360	11,389,258	11,660,618
CROWN SUB-TOTAL		653,473	121,601	8,553,017	9,328,091	17,474,539	1,185,131,797	1,202,606,336
PATENT	(2)	16	334	983	1,333	27,890	153,856	181,746
PATENT	(3)	16,128	1,304	590,476	607,908	147,384	73,691,881	73,839,265
PATENT	(4)	2,232	407	71,375	74,014	22,188	5,304,229	5,326,417
AGREEMENT FOREST	(8)	0	0	0	0	0	0	0
PATENT SUB-TOTAL		18,376	2,045	662,834	683,255	197,462	79,149,966	79,347,428
INDIAN RESERVES	(6)	68	0	5,296	5,364	0	522,834	522,834
OTHER FEDERAL	(9)	101	0	0	101	0	0	0
FEDERAL SUB-TOTAL		169	0	5,296	5,465	0	522,834	522,834
TOTAL		672,013	123,646	9,221,147	10,016,811	17,672,001	1,264,804,597	1,282,476,598

Table 17: Area and Gross Total Volume of the Northern Region Production Forest by Ownership and Major Forest Types (as of 1985).

(area in hectares; volume in cubic metres)

Ownership	Softwoods		Intolerant Hardwoods		Tolerant Hardwoods		Total	
	Area	Volume	Area	Volume	Area	Volume	Area	Volume
CROWN (1)	6,446,852	852,559,358	2,097,373	328,743,008	27,448	3,721,713	8,571,673	1,185,024,079
RECREATION								
RESERVES (7)	18,916	3,419,473	9,782	2,502,166	0	0	28,698	5,921,639
PROVINCIAL								
PARKS (5)	42,755	6,691,756	31,276	4,938,595	216	30,267	74,247	11,660,618
CROWN								
SUB-TOTAL	6,508,523	862,670,587	2,138,431	336,183,769	27,664	3,751,980	8,674,618	1,202,606,336
PATENT (2)	400	56,429	917	125,317	0	0	1,317	181,746
PATENT (3)	345,189	41,966,409	246,584	31,872,202	7	654	591,780	73,839,265
PATENT (4)	52,616	2,933,245	19,166	2,393,172	0	0	71,782	5,326,417
AGREEMENT								
FOREST (8)	0	0	0	0	0	0	0	0
PATENT								
SUB-TOTAL	398,205	44,956,083	266,667	34,390,691	7	654	664,879	79,347,428
INDIAN								
RESERVES (6)	3,721	340,303	1,575	182,531	0	0	5,296	522,834
OTHER								
FEDERAL (9)	0	0	0	0	0	0	0	0
FEDERAL								
SUB-TOTAL	3,721	340,303	1,575	182,531	0	0	5,296	522,834
TOTAL	6,910,449	907,966,973	2,406,673	370,756,991	27,671	3,752,634	9,344,793	1,282,476,598

Table 18: Area and Gross Total Volume (GTV) of the Northern Region Production Forest plus Production Forest Reserve by Working Group and Age Class (as of 1985).

(area in hectares; gross total volume in cubic metres)

Ownership: All

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121+	Total
WHITE PINE									
AREA	1,312	44	31	79	372	571	1,604	12,152	16,165
GTV	——		2,962	12,505	66,269	110,703	280,126	2,116,882	2,589,447
RED PINE									
AREA	46	333	62	72	302	209	269	269	1,562
GTV	——	5,647	3,151	8,555	50,343	32,917	47,318	43,283	191,214
JACK PINE									
AREA	67,691	61,962	167,819	250,975	230,963	74,527	28,424	4,892	887,253
GTV	——	1,124,311	17,144,431	38,488,114	45,423,322	14,340,375	4,902,257	887,855	122,310,665
SPRUCE									
AREA	908,505	105,071	153,423	383,125	624,349	706,521	1,223,681	1,170,818	5,275,493
GTV	——	1,077,874	8,271,777	39,730,806	98,449,960	122,659,322	223,122,533	197,636,888	690,949,160
BALSAM FIR									
AREA	32,025	25,358	134,937	233,290	101,617	31,967	9,891	4,307	573,392
GTV	——	379,096	13,500,952	30,423,236	15,839,821	5,540,143	1,974,450	727,050	68,384,748
HEMLOCK									
AREA						45			45
GTV	——					8,190			8,190
OTHER CONIFERS									
AREA	3,320	949	1,175	2,411	14,130	20,317	59,419	54,818	156,539
GTV	——	6,113	52,203	229,964	1,939,492	2,969,909	9,426,043	8,909,828	23,533,552
SOFTWOODS									
AREA	1,012,899	193,717	457,447	869,952	971,733	834,157	1,323,288	1,247,256	6,910,449
GTV	——	2,593,041	38,975,476	108,893,180	161,769,207	145,661,559	239,752,727	210,321,786	907,966,976

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
POPLAR									
AREA	134,674	63,449	200,689	486,684	481,249	207,461	60,887	13,541	1,648,634
GTV	—	1,659,732	20,916,232	89,543,667	115,408,881	48,185,231	14,056,687	3,331,827	293,102,257
WHITE BIRCH									
AREA	49,092	11,348	178,173	172,911	199,093	118,121	22,918	6,383	758,039
GTV	—	275,195	12,676,852	19,936,582	26,624,818	14,691,432	2,677,625	772,238	77,654,742
INTOLERANT HARDWOODS									
AREA	183,766	74,797	378,862	659,595	680,342	325,582	83,805	19,924	2,406,673
GTV	—	1,934,927	33,593,084	109,480,249	142,033,699	62,876,663	16,734,312	4,104,065	370,756,999
HARD MAPLE									
AREA	12		253	3,129	3,388	4,443	2,438	4,220	17,883
GTV	—		19,850	273,510	414,459	651,184	407,756	591,371	2,358,130
YELLOW BIRCH									
AREA	50		32	58	429	775	1,285	5,267	7,896
GTV	—		2,434	4,928	50,307	113,355	198,807	806,853	1,176,684
OTHER HARDWOODS									
AREA	6		288	551	373	400	136	138	1,892
GTV	—		16,279	53,514	52,319	54,656	18,167	22,887	217,822
TOLERANT HARDWOODS									
AREA	68	0	573	3,738	4,190	5,618	3,859	9,625	27,671
GTV	—	0	38,563	331,952	517,085	819,195	624,730	1,421,111	3,752,636
TOTAL									
AREA	**1,196,733**	**268,514**	**836,882**	**1,533,285**	**1,656,265**	**1,165,357**	**1,410,952**	**1,276,805**	**9,344,793**
GTV	—	**4,527,968**	**72,607,123**	**218,705,381**	**304,319,991**	**209,357,417**	**257,111,769**	**215,846,962**	**1,282,476,611**

Table 19: Major Classifications of the Northeastern Region Covered by the Forest Resources Inventory (as of 1985).

(hectares)

Ownership		Water	Non-Forested	Non-Productive	Productive	Total
CROWN	(1)	1,581,153	30,741	533,026	4,693,787	6,838,707
RECREATION RESERVES	(7)	476	40	2,971	9,465	12,952
PROVINCIAL PARKS	(5)	71,240	652	15,505	218,122	305,519
CROWN SUB-TOTAL		1,652,869	31,433	551,502	4,921,374	7,157,178
PATENT	(2)	0	0	4	2,450	2,454
PATENT	(3)	1,729	274,881	139,567	904,168	1,320,345
PATENT	(4)	0	2,753	20,417	291,423	314,593
AGREEMENT FOREST	(8)	0	0	0	0	0
PATENT SUB-TOTAL		1,729	277,634	159,988	1,198,041	1,637,392
INDIAN RESERVES	(6)	1,386	63,956	15,748	23,131	104,221
OTHER FEDERAL	(9)	22,870	21,263	201	221,991	266,325
FEDERAL SUB-TOTAL		24,256	85,219	15,949	245,122	370,546
TOTAL		1,678,854	394,286	727,439	6,364,537	9,165,116

Table 20: Area and Gross Total Volume of the Productive Forest of the Northeastern Region by Ownership (as of 1985).

(area in hectares; volume in cubic metres)

Ownership		Protection Forest (Area)	Protection Forest Reserve (Area)	Production Forest (Area)	Total (Area)	Protection Forest Reserve (Volume)	Production Forest (Volume)	Total (Volume)
CROWN	(1)	388,597	199,018	4,106,172	4,693,787	26,909,963	583,021,802	609,931,765
RECREATION RESERVES	(7)	1,376	0	8,089	9,465	0	1,138,492	1,138,492
PROVINCIAL PARKS	(5)	17,657	2,484	197,981	218,122	291,065	30,774,120	31,065,185
CROWN SUB-TOTAL		407,630	201,502	4,312,242	4,921,374	27,201,028	614,934,414	642,135,442
PATENT	(2)	116	65	2,269	2,450	10,374	397,668	408,042
PATENT	(3)	70,504	7,500	826,164	904,168	488,077	99,840,562	100,328,639
PATENT	(4)	22,610	25,553	243,260	291,423	3,657,880	33,910,072	37,567,952
AGREEMENT FOREST	(8)	0	0	0	0	0	0	0
PATENT SUB-TOTAL		93,230	33,118	1,071,693	1,198,041	4,156,331	134,148,302	138,304,633
INDIAN RESERVES	(6)	795	0	22,336	23,131	0	3,628,904	3,628,904
OTHER FEDERAL	(9)	35,040	0	186,951	221,991	0	20,375,647	20,375,647
FEDERAL SUB-TOTAL		35,835	0	209,287	245,122	0	24,004,551	24,004,551
TOTAL		536,695	234,620	5,593,222	6,364,537	31,357,359	773,087,267	804,444,626

Table 21: Area and Gross Total Volume of the Northeastern Region Production Forest by Ownership and Major Forest Types (as of 1985).

(area in hectares; volume in cubic metres)

Ownership	Softwoods		Intolerant Hardwoods		Tolerant Hardwoods		Total	
	Area	Volume	Area	Volume	Area	Volume	Area	Volume
CROWN (1)	2,003,287	280,931,062	1,685,821	233,261,736	616,082	95,738,967	4,305,190	609,931,765
RECREATION RESERVES (7)	2,805	418,871	3,291	432,945	1,993	286,676	8,089	1,138,492
PROVINCIAL PARKS (5)	66,471	9,514,427	49,786	6,120,001	84,208	15,430,757	200,465	31,065,185
CROWN SUB-TOTAL	2,072,563	290,864,360	1,738,898	239,814,682	702,283	111,456,400	4,513,744	642,135,442
PATENT (2)	568	101,624	1,722	298,905	44	7,513	2,334	408,042
PATENT (3)	278,005	28,736,475	318,014	35,684,271	237,645	35,907,893	833,664	100,328,639
PATENT (4)	106,133	14,042,806	117,937	14,591,657	44,743	8,933,489	268,813	37,567,952
AGREEMENT FOREST (8)	0	0	0	0	0	0	0	0
PATENT SUB-TOTAL	384,706	42,880,905	437,673	50,574,833	282,432	44,848,895	1,104,811	138,304,633
INDIAN RESERVES (6)	4,396	673,155	5,559	672,395	12,381	2,283,354	22,336	3,628,904
OTHER FEDERAL (9)	64,649	8,486,853	120,419	11,665,410	1,883	223,384	186,951	20,375,647
FEDERAL SUB-TOTAL	69,045	9,160,008	125,978	12,337,805	14,264	2,506,738	209,287	24,004,551
TOTAL	2,526,314	342,905,273	2,302,549	302,727,320	998,979	158,812,033	5,827,842	804,444,626

Table 22: Area and Gross Total Volume (GTV) of the Northeastern Region Production Forest plus Production Forest Reserve by Working Group and Age Group (as of 1985).

(area in hectares; gross total volume in cubic metres)

Ownership: All

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
WHITE PINE									
AREA	18,712	6,934	2,045	4,372	24,935	83,166	28,691	69,012	237,867
GTV	—	45,961	124,246	625,133	4,178,015	14,942,095	5,403,005	15,034,522	40,352,977
RED PINE									
AREA	5,115	8,405	5,351	3,777	7,229	16,104	4,915	9,215	60,111
GTV	—	80,068	401,538	555,650	1,321,881	3,320,424	899,662	1,881,669	8,460,892
JACK PINE									
AREA	46,361	21,567	143,472	137,791	190,686	106,565	32,024	7,618	686,084
GTV	—	345,207	14,499,757	21,603,495	32,571,063	19,310,880	5,218,394	1,244,684	94,793,480
SPRUCE									
AREA	125,624	21,878	38,257	101,934	179,942	214,679	187,529	110,617	980,460
GTV	—	173,906	2,204,438	12,352,331	26,733,586	33,829,746	31,149,174	18,315,294	124,758,475
BALSAM FIR									
AREA	13,567	29,227	31,991	108,370	118,994	33,952	6,330	1,440	343,871
GTV	—	157,288	2,712,445	15,880,318	19,553,627	5,911,329	1,059,574	239,553	45,514,134
HEMLOCK									
AREA	109	33		52	688	2,393	3,702	18,605	25,582
GTV	—	1,249		6,206	115,329	406,604	586,132	3,348,541	4,464,061
OTHER CONIFERS									
AREA	20,419	2,094	1,526	15,833	39,749	22,353	23,649	66,716	192,339
GTV	—	23,336	97,913	1,592,574	4,904,441	3,307,671	3,692,063	10,943,261	24,561,259
SOFTWOODS									
AREA	229,907	90,138	222,642	372,129	562,223	479,212	286,840	283,223	2,526,314
GTV	—	827,015	20,040,337	52,615,707	89,377,942	81,028,749	48,008,004	51,007,524	342,905,278

Continuation of TABLE 22

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
POPLAR									
AREA	57,110	27,165	98,103	258,875	323,718	129,796	27,330	6,339	928,436
GTV	—	452,774	9,929,450	42,169,800	63,126,873	28,522,264	5,825,087	1,334,669	151,360,917
WHITE BIRCH									
AREA	74,871	19,223	114,278	328,878	395,498	267,709	113,679	59,977	1,374,113
GTV	—	364,043	8,924,445	39,311,393	48,989,413	32,955,087	13,604,645	7,217,381	151,366,407
INTOLERANT HARDWOODS									
AREA	131,981	46,388	212,381	587,753	719,216	397,505	141,009	66,316	2,302,549
GTV	—	816,817	18,853,895	81,481,193	112,116,286	61,477,351	19,429,732	8,552,050	302,727,324
HARD MAPLE									
AREA	11,378	33,767	12,589	77,781	85,970	81,973	93,026	408,229	804,713
GTV	—	120,506	624,857	7,891,487	11,279,924	12,703,109	15,960,433	80,160,194	128,740,510
YELLOW BIRCH									
AREA	1,161	675	370	1,469	3,514	6,454	8,396	107,247	129,286
GTV	—	2,443	14,298	141,379	457,611	852,115	1,356,752	20,093,251	22,917,849
OTHER HARDWOODS									
AREA	5,402	4,219	2,257	13,252	19,402	9,452	4,534	6,462	64,980
GTV	—	8,646	116,710	1,448,492	2,207,030	1,421,103	736,373	1,215,325	7,153,679
TOLERANT HARDWOODS									
AREA	17,941	38,661	15,216	92,502	108,886	97,879	105,956	521,938	998,979
GTV	—	131,595	755,865	9,481,358	13,944,565	14,976,327	18,053,558	101,468,770	158,812,038
TOTAL									
AREA	**379,829**	**175,187**	**450,239**	**1,052,384**	**1,390,325**	**974,596**	**533,805**	**871,477**	**5,827,842**
GTV	—	**1,775,427**	**39,650,097**	**143,578,258**	**215,438,793**	**157,482,427**	**85,491,294**	**161,028,344**	**804,444,640**

Table 23: Major Classifications of the Algonquin Region Covered by the Forest Resources Inventory (as of 1985).

(hectares)

Ownership		Water	Non-Forested	Non-Productive	Productive	Total
CROWN RECREATION	(1)	531,683	12,881	219,258	978,494	1,742,316
RESERVES PROVINCIAL	(7)	0	1,185	13,710	126,002	140,897
PARKS	(5)	0	2,740	45,786	525,950	574,476
CROWN SUB-TOTAL		531,683	16,806	278,754	1,630,446	2,457,689
PATENT	(2)	0	0	4	0	4
PATENT	(3)	223	325,540	89,049	1,096,278	1,511,090
PATENT	(4)	0	0	0	0	0
AGREEMENT FOREST	(8)	0	314	840	9,044	10,198
PATENT SUB-TOTAL		223	325,854	89,893	1,105,322	1,521,292
INDIAN RESERVES	(6)	0	5,474	30,319	0	35,793
OTHER FEDERAL	(9)	1,258	37,309	2,467	25	41,059
FEDERAL SUB-TOTAL		1,258	42,783	32,786	25	76,852
TOTAL		533,164	385,443	401,433	2,735,793	4,055,833

Table 24: Area and Gross Total Volume of the Productive Forest of the Algonquin Region by Ownership (as of 1985).

(area in hectares; volume in cubic metres)

Ownership		Protection Forest (Area)	Protection Forest Reserve (Area)	Production Forest (Area)	Total (Area)	Protection Forest Reserve (Volume)	Production Forest (Volume)	Total (Volume)
CROWN	(1)	145,293	39,153	794,048	978,494	5,436,210	115,918,979	121,355,189
RECREATION RESERVES	(7)	6,629	23,437	95,936	126,002	3,528,253	16,617,802	20,146,055
PROVINCIAL PARKS	(5)	7,935	18,014	500,001	525,950	2,675,169	87,262,347	89,937,516
CROWN SUB-TOTAL		159,857	80,604	1,389,985	1,630,446	11,639,632	219,799,128	231,438,760
PATENT	(2)	0	0	0	0	0	0	0
PATENT	(3)	68,513	9,187	1,018,578	1,096,278	1,283,841	145,907,328	147,191,169
PATENT	(4)	0	0	0	0	0	0	0
AGREEMENT FOREST	(8)	729	0	8,315	9,044	0	884,509	884,509
PATENT SUB-TOTAL		69,242	9,187	1,026,893	1,105,322	1,283,841	146,791,837	148,075,678
INDIAN RESERVES	(6)	0	0	0	0	0	0	0
OTHER FEDERAL	(6)	0	0	25	25	0	2,427	2,427
FEDERAL SUB-TOTAL		0	0	25	25	0	2,427	2,427
TOTAL		229,099	89,791	2,416,903	2,735,793	12,923,473	366,593,392	379,516,865

Table 25: Area and Gross Total Volume of the Algonquin Region Production Forest by Ownership and Major Forest Types (as of 1985).

(area in hectares; volume in cubic metres)

Ownership	Softwoods		Intolerant Hardwoods		Tolerant Hardwoods		Total	
	Area	Volume	Area	Volume	Area	Volume	Area	Volume
CROWN (1)	243,419	38,000,433	213,143	29,616,127	376,639	53,738,629	833,201	121,355,189
RECREATION RESERVES (7)	40,374	6,551,611	21,546	3,544,669	57,453	10,049,775	119,373	20,146,055
PROVINCIAL PARKS (5)	153,200	26,501,220	110,701	20,800,452	254,114	42,635,844	518,015	89,937,516
CROWN SUB-TOTAL	436,993	71,053,264	345,390	53,961,248	688,206	106,424,248	1,470,589	231,438,760
PATENT (2)	0	0	0	0	0	0	0	0
PATENT (3)	232,393	30,521,983	177,978	25,266,564	617,394	91,402,622	1,027,765	147,191,169
PATENT (4)	0	0	0	0	0	0	0	0
AGREEMENT FOREST (8)	3,506	286,090	2,330	329,470	2,479	268,949	8,315	884,509
PATENT SUB-TOTAL	235,899	30,808,073	180,308	25,596,034	619,873	91,671,571	1,036,080	148,075,678
INDIAN RESERVES (6)	0	0	0	0	0	0	0	0
OTHER FEDERAL (9)	18	848	7	1,579	0	0	25	2,427
FEDERAL SUB-TOTAL	18	848	7	1,579	0	0	25	2,427
TOTAL	672,910	101,862,185	525,705	79,558,861	1,308,079	198,095,819	2,506,694	379,516,865

Table 26: Area and Gross Total Volume (GTV) of the Algonquin Region Production Forest plus Production Forest Reserve by Working Group and Age Class (as of 1985).

(area in hectares; gross total volume in cubic metres)

Ownership: All

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
WHITE PINE									
AREA	20,636	779	2,731	18,889	86,350	106,711	18,331	7,939	262,366
GTV	—	16,222	309,363	2,942,243	15,983,329	21,137,440	3,674,362	1,345,806	45,408,765
RED PINE									
AREA	4,566	9,122	3,162	3,840	11,077	6,186	266		38,219
GTV	—	115,090	268,455	538,422	2,080,710	1,216,386	51,840		4,270,903
JACK PINE									
AREA	2,153	2,519	2,352	6,104	7,212	1,144	44		21,528
GTV	—	79,504	197,442	785,888	1,125,897	210,730	8,798		2,408,259
SPRUCE									
AREA	11,935	572	2,052	10,789	24,334	18,133	7,229	2,307	77,351
GTV	—	6,555	168,786	1,446,559	3,482,874	2,666,829	973,002	324,328	9,068,933
BALSAM FIR									
AREA	4,371	448	6,028	42,125	39,374	21,687	4,439	1,301	119,773
GTV	—	15,667	526,190	5,647,460	6,599,222	3,198,527	635,148	180,228	16,802,442
HEMLOCK									
AREA	208	10	55	1,694	4,236	8,888	8,503	49,169	72,763
GTV	—	546	4,610	178,533	615,489	1,428,761	1,458,883	9,952,641	13,639,463
OTHER CONIFERS									
AREA	5,044	65	466	6,576	24,405	26,953	12,417	4,984	80,910
GTV	—	1,081	38,693	707,096	3,124,480	3,794,548	1,866,327	731,196	10,263,421
SOFTWOODS									
AREA	48,913	13,515	16,846	90,017	196,988	189,702	51,229	65,700	672,910
GTV	—	234,665	1,513,539	12,246,201	33,012,001	33,653,220	8,668,360	12,534,199	101,862,186

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121+	Total
POPLAR									
AREA	16,225	2,961	19,792	162,011	166,670	37,068	4,574	120	409,421
GTV	—	61,865	1,793,421	23,882,455	29,303,400	7,678,751	1,035,295	33,204	63,788,391
WHITE BIRCH									
AREA	5,485	147	3,225	42,584	53,575	10,275	986	7	116,284
GTV	—	5,063	296,641	5,683,027	8,033,511	1,606,697	144,463	1,068	15,770,470
INTOLERANT HARDWOODS									
AREA	21,710	3,108	23,017	204,595	220,245	47,343	5,560	127	525,705
GTV	—	66,928	2,090,062	29,565,482	37,336,911	9,285,448	1,179,758	34,272	79,558,861
HARD MAPLE									
AREA	25,001	2,058	5,462	100,869	179,035	201,269	174,053	274,132	961,879
GTV	—	17,027	391,234	11,334,850	25,023,902	32,165,715	31,085,381	52,720,608	152,738,717
YELLOW BIRCH									
AREA	545	18		522	1,471	3,386	4,034	29,539	39,515
GTV	—	546		54,725	199,779	521,977	699,559	5,512,672	6,989,258
OTHER HARDWOODS									
AREA	7,792	51	2,547	47,454	110,374	82,949	34,763	20,755	306,685
GTV	—	686	162,904	4,601,654	13,033,677	11,381,926	5,450,814	3,736,177	38,367,838
TOLERANT HARDWOODS									
AREA	33,338	2,127	8,009	148,845	290,880	287,604	212,850	324,426	1,308,079
GTV	—	18,259	554,138	15,991,229	38,257,358	44,069,618	37,235,754	61,969,457	198,095,813
TOTAL									
AREA	**103,961**	**18,750**	**47,872**	**443,457**	**708,113**	**524,649**	**269,639**	**390,253**	**2,506,694**
GTV	—	**319,852**	**4,157,739**	**57,802,912**	**108,606,270**	**87,008,286**	**47,083,872**	**74,537,928**	**379,516,860**

Table 27: Major Classifications of the Eastern Region Covered by the Forest Resources Inventory (as of 1985).

(hectares)

Ownership		Water	Non-Forested	Non-Productive	Productive	Total
CROWN RECREATION	(1)	343,619	8,282	41,757	215,165	608,823
RESERVES PROVINCIAL	(7)	0	0	0	0	0
PARKS	(5)	0	2,890	2,031	12,598	17,519
CROWN SUB-TOTAL		343,619	11,172	43,788	227,763	626,342
PATENT	(2)	0	0	0	0	0
PATENT	(3)	0	1,238,146	139,640	925,349	2,303,135
PATENT	(4)	0	0	0	0	0
AGREEMENT FOREST	(8)	0	2,223	6,150	38,840	47,213
PATENT SUB-TOTAL		0	1,240,369	145,790	964,189	2,350,348
INDIAN RESERVES	(6)	0	8,207	0	0	8,207
OTHER FEDERAL	(9)	835	8,920	356	1,942	12,053
FEDERAL SUB-TOTAL		835	17,127	356	1,942	20,260
TOTAL		344,454	1,268,668	189,934	1,193,894	2,996,950

Table 28: Area and Gross Total Volume of the Productive Forest of the Eastern Region by Ownership (as of 1985).

(area in hectares; volume in cubic metres)

Ownership		Protection Forest (Area)	Protection Forest Reserve (Area)	Production Forest (Area)	Total (Area)	Protection Forest Reserve (Volume)	Production Forest (Volume)	Total (Volume)
CROWN	(1)	2,311	67,757	145,097	215,165	7,499,251	22,994,620	30,493,871
RECREATION								
RESERVES	(7)	0	0	0	0	0	0	0
PROVINCIAL								
PARKS	(5)	962	4,287	7,349	12,598	378,795	1,007,637	1,386,432
CROWN SUB-TOTAL		3,273	72,044	152,446	227,763	7,878,046	24,002,257	31,880,303
PATENT	(2)	0	0	0	0	0	0	0
PATENT	(3)	24,213	116,286	784,850	925,349	9,874,382	76,442,032	86,316,414
PATENT	(4)	0	0	0	0	0	0	0
AGREEMENT								
FOREST	(8)	378	2,847	35,615	38,840	229,607	3,115,071	3,344,678
PATENT SUB-TOTAL		24,591	119,133	820,465	964,189	10,103,989	79,557,103	89,661,092
INDIAN								
RESERVES	(6)	0	0	0	0	0	0	0
OTHER								
FEDERAL	(9)	107	0	1,835	1,942	0	141,079	141,079
FEDERAL SUB-TOTAL		107	0	1,835	1,942	0	141,079	141,079
TOTAL		27,971	191,177	974,746	1,193,894	17,982,035	103,700,439	121,682,474

Table 29: Area and Gross Total Volume of the Eastern Region Production Forest by Ownership and Major Forest Types (as of 1985).

(area in hectares; volume in cubic metres)

Ownership	Softwoods		Intolerant Hardwoods		Tolerant Hardwoods		Total	
	Area	Volume	Area	Volume	Area	Volume	Area	Volume
CROWN (1)	52,583	10,098,379	35,902	6,008,443	124,369	14,387,049	212,854	30,493,871
RECREATION RESERVES (7)	0	0	0	0	0	0	0	0
PROVINCIAL PARKS (5)	2,199	350,202	2,426	384,620	7,011	651,610	11,636	1,386,432
CROWN SUB-TOTAL	54,782	10,448,581	38,328	6,393,063	131,380	15,038,659	224,490	31,880,303
PATENT (2)	0	0	0	0	0	0	0	0
PATENT (3)	269,092	26,427,952	95,038	10,998,823	537,006	48,889,639	901,136	86,316,414
PATENT (4)	0	0	0	0	0	0	0	0
AGREEMENT FOREST (8)	18,160	1,527,255	6,255	546,637	14,047	1,270,786	38,462	3,344,678
PATENT SUB-TOTAL	287,252	27,955,207	101,293	11,545,460	551,053	50,160,425	939,598	89,661,092
INDIAN RESERVES (6)	0	0	0	0	0	0	0	0
OTHER FEDERAL (9)	521	41,881	301	26,328	1,013	72,870	1,835	141,079
FEDERAL SUB-TOTAL	521	41,881	301	26,328	1,013	72,870	1,835	141,079
TOTAL	342,555	38,445,669	139,922	17,964,851	683,446	65,271,954	1,165,923	121,682,474

Table 30: Area and Gross Total Volume (GTV) of the Eastern Region Production Forest plus Production Forest Reserve by Working Group and Age Class (as of 1985).

(area in hectares; gross total volume in cubic metres)

Ownership: All

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
WHITE PINE									
AREA	8,132	1,436	8,788	18,920	26,138	4,814	548	97	68,873
GTV	—	37,987	1,138,207	3,481,133	6,762,429	1,422,112	163,463	30,435	13,035,766
RED PINE									
AREA	1,854	6,424	3,425	716	790	230			13,439
GTV	—	108,953	356,321	112,161	172,414	54,445			804,294
JACK PINE									
AREA	358	2,596	1,394	214	11				4,573
GTV	—	61,389	122,761	30,047	1,438				215,635
SPRUCE									
AREA	2,461	4,093	2,347	1,550	1,030	158	28		11,667
GTV	—	65,519	238,315	216,613	182,181	33,162	5,918		741,708
BALSAM FIR									
AREA	550	30	2,637	9,318	333	11			12,879
GTV	—	968	336,952	1,386,015	62,629	2,587			1,789,151
HEMLOCK									
AREA	226	13	616	3,100	5,601	4,217	408	247	14,428
GTV	—	611	53,337	403,337	950,189	855,824	96,679	63,445	2,423,422
OTHER CONIFERS									
AREA	68,462	621	10,159	73,281	54,547	7,904	1,361	361	216,696
GTV	—	12,036	923,170	8,824,269	8,054,578	1,316,290	233,629	71,722	19,435,694
SOFTWOODS									
AREA	82,043	15,213	29,366	107,099	88,450	17,334	2,345	705	342,555
GTV	—	287,463	3,169,063	14,453,575	16,185,858	3,684,420	499,689	165,602	38,445,670

Continuation of TABLE 30

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
POPLAR									
AREA	27,038	2,557	32,517	49,654	7,136	514			119,416
GTV	—	111,322	4,281,854	8,846,775	1,553,887	124,532			14,918,370
WHITE BIRCH									
AREA	1,751	277	5,823	11,002	1,539	110	4		20,506
GTV	—	16,838	731,930	1,936,643	333,339	27,364	372		3,046,486
INTOLERANT HARDWOODS									
AREA	28,789	2,834	38,340	60,656	8,675	624	4	0	139,922
GTV	—	128,160	5,013,784	10,783,418	1,887,226	151,896	372	0	17,964,856
HARD MAPLE									
AREA	82,362	3,873	98,173	187,033	93,595	15,082	2,500	817	483,435
GTV	—	137,241	7,850,958	21,212,846	14,416,848	2,658,874	480,493	163,026	46,920,286
YELLOW BIRCH									
AREA	6	26	226	339	186	24			807
GTV	—	847	17,214	37,224	26,961	4,387			86,633
OTHER HARDWOODS									
AREA	32,649	2,131	35,960	68,534	53,818	5,238	663	211	199,204
GTV	—	75,693	2,462,597	7,292,754	7,389,369	890,761	115,203	38,659	18,265,036
TOLERANT HARDWOODS									
AREA	115,017	6,030	134,359	255,906	147,599	20,344	3,163	1,028	683,446
GTV	—	213,781	10,330,769	28,542,824	21,833,178	3,554,022	595,696	201,685	65,271,955
TOTAL									
AREA	**225,849**	**24,077**	**202,065**	**423,661**	**244,724**	**38,302**	**5,512**	**1,733**	**1,165,923**
GTV	—	**629,404**	**18,513,616**	**53,779,817**	**39,906,262**	**7,390,338**	**1,095,757**	**367,287**	**121,682,481**

Table 31: Major Classifications of the Central Region Covered by the Forest Resources Inventory (as of 1985).

(hectares)

Ownership		Water	Non-Forested	Non-Productive	Productive	Total
CROWN RECREATION	(1)	390,025	15,055	9,261	34,214	448,555
RESERVES	(7)	0	0	0	0	0
PROVINCIAL PARKS	(5)	0	1,635	64	2,820	4,519
CROWN SUB-TOTAL		390,025	16,690	9,325	37,034	453,074
PATENT	(2)	0	0	0	0	0
PATENT	(3)	0	1,893,428	57,716	639,363	2,590,507
PATENT AGREEMENT	(4)	0	0	0	0	0
FOREST	(8)	0	1,110	761	25,419	27,290
PATENT SUB-TOTAL		0	1,894,538	58,477	664,782	2,617,797
INDIAN RESERVES	(6)	0	30,328	126	1,511	31,965
OTHER FEDERAL	(9)	26	18,221	264	6,909	25,420
FEDERAL SUB-TOTAL		26	48,549	390	8,420	57,385
TOTAL		390,051	1,959,777	68,192	710,236	3,128,256

Table 32: Area and Gross Total Volume of the Productive Forest of the Central Region by Ownership (as of 1985).

(area in hectares; volume in cubic metres)

Ownership		Protection Forest (Area)	Protection Forest Reserve (Area)	Production Forest (Area)	Total (Area)	Protection Forest Reserve (Volume)	Production Forest (Volume)	Total (Volume)
CROWN RECREATION	(1)	102	13,851	20,261	34,214	993,108	3,113,864	4,106,972
RESERVES	(7)	0	0	0	0	0	0	0
PROVINCIAL PARKS	(5)	0	124	2,696	2,820	7,724	398,783	406,507
CROWN SUB-TOTAL		102	13,975	22,957	37,034	1,000,832	3,512,647	4,513,479
PATENT	(2)	0	0	0	0	0	0	0
PATENT	(3)	3,586	14,597	621,180	639,363	1,216,829	61,652,872	62,869,701
PATENT	(4)	0	0	0	0	0	0	0
AGREEMENT FOREST	(8)	125	20	25,274	25,419	1,716	3,359,129	3,360,845
PATENT SUB-TOTAL		3,711	14,617	646,454	664,782	1,218,545	65,012,001	66,230,546
INDIAN RESERVES	(6)	45	14	1,452	1,511	0	168,382	168,382
OTHER FEDERAL	(9)	53	28	6,828	6,909	1,376	969,151	970,527
FEDERAL SUB-TOTAL		98	42	8,280	8,420	1,376	1,137,533	1,138,909
TOTAL		3,911	28,634	677,691	710,236	2,220,753	69,662,181	71,882,934

Table 33: Area and Gross Total Volume of the Central Region Production Forest by Ownership and Major Forest Types (as of 1985).

(area in hectares; volume in cubic metres)

Ownership	Softwoods		Intolerant Hardwoods		Tolerant Hardwoods		Total	
	Area	Volume	Area	Volume	Area	Volume	Area	Volume
CROWN (1)	8,483	1,185,279	5,984	983,739	19,645	1,937,954	34,112	4,106,972
RECREATION RESERVES (7)	0	0	0	0	0	0	0	0
PROVINCIAL PARKS (5)	453	48,196	301	36,223	2,066	322,088	2,820	406,507
CROWN SUB-TOTAL	8,936	1,233,475	6,285	1,019,962	21,711	2,260,042	36,932	4,513,479
PATENT (2)	0	0	0	0	0	0	0	0
PATENT (3)	233,521	19,968,260	113,480	13,435,664	288,776	29,465,777	635,777	62,869,701
PATENT (4)	0	0	0	0	0	0	0	0
AGREEMENT FOREST (8)	14,755	1,838,682	3,726	588,757	6,813	933,406	25,294	3,360,845
PATENT SUB-TOTAL	248,276	21,806,942	117,206	14,024,421	295,589	30,399,183	661,071	66,230,546
INDIAN RESERVES (6)	204	8,680	256	38,896	1,006	120,806	1,466	168,382
OTHER FEDERAL (9)	2,223	314,375	3,161	545,949	1,472	110,203	6,856	970,527
FEDERAL SUB-TOTAL	2,427	323,055	3,417	584,845	2,478	231,009	8,322	1,138,909
TOTAL	259,639	23,363,472	126,908	15,629,228	319,778	32,890,234	706,325	71,882,934

Table 34: Area and Gross Total Volume (GTV) of the Central Region Production Forest plus Production Forest Reserve by Working Group and Age Class (as of 1985).

(area in hectares; gross total volume in cubic metres)

Ownership: All

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
WHITE PINE									
AREA	6,855	2,544	3,747	3,222	4,154	1,630	177	99	22,428
GTV	—	50,284	415,130	653,896	952,252	405,639	53,014	29,365	2,559,580
RED PINE									
AREA	10,521	8,699	11,038	3,707	449	11			34,425
GTV	—	218,989	1,523,418	599,748	79,218	2,184			2,423,557
JACK PINE									
AREA	3,279	7,366	8,546	1,042	102				20,335
GTV	—	327,438	1,013,977	153,303	18,384				1,513,102
SPRUCE									
AREA	1,937	2,291	1,519	596	354	156	9	2	6,864
GTV	—	62,673	188,702	80,740	54,904	27,317	1,966	373	416,675
BALSAM FIR									
AREA	111		824	735	237	39			1,946
GTV	—		111,745	102,704	36,893	6,204			257,546
HEMLOCK									
AREA	523	8	169	809	3,176	2,701	681	324	8,391
GTV	—	198	17,101	102,504	521,725	502,567	147,446	73,096	1,364,637
OTHER CONIFERS									
AREA	52,821	224	4,296	54,286	41,892	9,067	1,947	717	165,250
GTV	—	7,682	404,703	6,481,438	5,959,827	1,484,667	351,952	138,104	14,828,373
SOFTWOODS									
AREA	76,047	21,132	30,139	64,397	50,364	13,604	2,814	1,142	259,639
GTV	—	667,264	3,674,776	8,174,333	7,623,203	2,428,578	554,378	240,938	23,363,470

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
POPLAR									
AREA	30,413	1,166	24,099	45,149	12,543	648	6		114,024
GTV	—	61,049	3,034,169	7,681,497	2,749,004	154,672	1,194		13,681,585
WHITE BIRCH									
AREA	941	26	3,564	5,709	2,343	285	16		12,884
GTV	—	1,617	446,936	944,637	491,855	59,608	2,992		1,947,645
INTOLERANT HARDWOODS									
AREA	31,354	1,192	27,663	50,858	14,886	933	22	0	126,908
GTV	—	62,666	3,481,105	8,626,134	3,240,859	214,280	4,186	0	15,629,230
HARD MAPLE									
AREA	35,583	619	18,816	63,141	64,096	15,236	2,849	1,832	202,172
GTV	—	21,231	1,546,389	7,773,485	10,160,631	2,777,017	584,248	388,299	23,251,300
YELLOW BIRCH									
AREA	99		137	917	691	154	76	41	2,115
GTV	—		10,536	109,900	107,796	28,922	15,698	8,779	281,631
OTHER HARDWOODS									
AREA	42,137	467	11,329	29,984	23,700	5,832	1,370	672	115,491
GTV	—	14,954	846,543	3,394,206	3,585,520	1,083,343	284,891	147,845	9,357,302
TOLERANT HARDWOODS									
AREA	77,819	1,086	30,282	94,042	88,487	21,222	4,295	2,545	319,778
GTV	—	36,185	2,403,468	11,277,591	13,853,947	3,889,282	884,837	544,923	32,890,233
TOTAL									
AREA	**185,220**	**23,410**	**88,084**	**209,297**	**153,737**	**35,759**	**7,131**	**3,687**	**706,325**
GTV	—	**766,115**	**9,559,349**	**28,078,058**	**24,718,009**	**6,532,140**	**1,443,401**	**785,861**	**71,882,933**

Table 35: Major Classifications of the Southwestern Region Covered by the Forest Resources Inventory (as of 1985).

(hectares)

Ownership		Water	Non-Forested	Non-Productive	Productive	Total
CROWN	(1)	547,335	4,280	2,083	16,700	570,398
RECREATION RESERVES	(7)	0	0	0	0	0
PROVINCIAL PARKS	(5)	0	1,389	711	3,423	5,523
CROWN SUB-TOTAL		547,335	5,669	2,794	20,123	575,921
PATENT	(2)	0	0	0	0	0
PATENT	(3)	0	2,451,044	20,390	544,022	3,015,456
PATENT	(4)	0	0	0	0	0
AGREEMENT FOREST	(8)	0	540	1,105	26,730	28,375
PATENT SUB-TOTAL		0	2,451,584	21,495	570,752	3,043,831
INDIAN RESERVES	(6)	0	45,333	0	0	45,333
OTHER FEDERAL	(9)	0	12,126	2,321	1,512	15,959
FEDERAL SUB-TOTAL		0	57,459	2,321	1,512	61,292
TOTAL		547,335	2,514,712	26,610	592,387	3,681,044

Table 36: Area and Gross Total Volume of the Productive Forest of the Southwestern Region by Ownership (as of 1985).

(area in hectares; volume in cubic metres)

Ownership		Protection Forest (Area)	Protection Forest Reserve (Area)	Production Forest (Area)	Total (Area)	Protection Forest Reserve (Volume)	Production Forest (Volume)	Total (Volume)
CROWN RECREATION	(1)	182	5,018	11,500	16,700	539,999	1,600,896	2,140,895
RESERVES	(7)	0	0	0	0	0	0	0
PROVINCIAL PARKS	(5)	0	0	3,423	3,423	0	389,101	389,101
CROWN SUB-TOTAL		182	5,018	14,923	20,123	539,999	1,989,997	2,529,996
PATENT	(2)	0	0	0	0	0	0	0
PATENT	(3)	1,762	21,729	520,531	544,022	2,040,646	52,015,136	54,055,782
PATENT	(4)	0	0	0	0	0	0	0
AGREEMENT FOREST	(8)	117	1,546	25,067	26,730	166,963	3,065,690	3,232,653
PATENT SUB-TOTAL		1,879	23,275	545,598	570,752	2,207,609	55,080,826	57,288,435
INDIAN RESERVES	(6)	0	0	0	0	0	0	0
OTHER FEDERAL	(9)	0	1,456	56	1,512	15,669	10,548	26,217
FEDERAL SUB-TOTAL		0	1,456	56	1,512	15,669	10,548	26,217
TOTAL		2,061	29,749	560,577	592,387	2,763,277	57,081,371	59,844,648

Table 37: Area and Gross Total Volume of the Southwestern Region Production Forest by Ownership and Major Forest Types (as of 1985).

(area in hectares; volume in cubic metres)

Ownership	Softwoods		Intolerant Hardwoods		Tolerant Hardwoods		Total	
	Area	Volume	Area	Volume	Area	Volume	Area	Volume
CROWN (1)	7,159	946,670	3,532	496,923	5,827	697,302	16,518	2,140,895
RECREATION RESERVES (7)	0	0	0	0	0	0	0	0
PROVINCIAL PARKS (5)	804	126,411	37	3,372	2,582	259,318	3,423	389,101
CROWN SUB-TOTAL	7,963	1,073,081	3,569	500,295	8,409	956,620	19,941	2,529,996
PATENT (2)	0	0	0	0	0	0	0	0
PATENT (3)	115,229	12,249,324	40,694	5,028,119	386,337	36,778,339	542,260	54,055,782
PATENT (4)	0	0	0	0	0	0	0	0
AGREEMENT FOREST (8)	11,751	1,392,960	3,327	418,523	11,535	1,421,170	26,613	3,232,653
PATENT SUB-TOTAL	126,980	13,642,284	44,021	5,446,642	397,872	38,199,509	568,873	57,288,435
INDIAN RESERVES (6)	0	0	0	0	0	0	0	0
OTHER FEDERAL (9)	0	0	1,456	24,779	56	1,438	1,512	26,217
FEDERAL SUB-TOTAL	0	0	1,456	24,779	56	1,438	1,512	26,217
TOTAL	134,943	14,715,365	49,046	5,971,716	406,337	39,157,567	590,326	59,844,648

Table 38: Area and Gross Total Volume (GTV) for the Southwestern Region Production Forest plus Production Forest Reserve by Working Group and Age Class (as of 1985).

(area in hectares; gross total volume in cubic metres)

Ownership: All

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
WHITE PINE									
AREA	1,890	5,194	3,750	1,852	1,344	399	145		14,574
GTV	—	116,705	472,393	368,345	303,319	91,156	31,774		1,383,692
RED PINE									
AREA	384	910	1,961	1,253	401	253	16		5,178
GTV	—	20,205	286,129	240,539	63,741	57,388	2,610		670,612
JACK PINE									
AREA	404	1,038	2,970	1,214	120	207			5,953
GTV	—	44,328	376,264	197,659	18,788	41,065			678,104
SPRUCE									
AREA	369	1,227	868	295	41	13			2,813
GTV	—	24,021	105,206	43,378	6,004	2,358			180,967
BALSAM FIR									
AREA	25	20	276	503	90				914
GTV	—	653	37,465	66,097	13,426				117,641
HEMLOCK									
AREA	373	25	54	805	1,678	819	151	77	3,982
GTV	—	1,172	8,463	124,125	309,603	166,791	29,970	16,768	656,892
OTHER CONIFERS									
AREA	26,115	243	1,428	25,907	43,303	4,221	223	89	101,529
GTV	—	8,772	168,712	3,408,411	6,597,032	779,959	45,052	19,526	11,027,464
SOFTWOODS									
AREA	29,560	8,657	11,307	31,829	46,977	5,912	535	166	134,943
GTV	—	215,856	1,454,632	4,448,554	7,311,913	1,138,717	109,406	36,294	14,715,372

Continuation of TABLE 38

Working Groups	Barren & Scattered	Age Classes 1–20	21–40	41–60	61–80	81–100	101–120	121 +	Total
POPLAR									
AREA	9,452	396	9,970	14,271	2,729	93	4		36,915
GTV	——	23,817	1,219,689	2,350,080	534,437	20,844	713		4,149,580
WHITE BIRCH									
AREA	1,163	14	1,427	7,509	1,889	125		4	12,131
GTV	——	885	181,204	1,246,500	367,445	25,511		589	1,822,134
INTOLERANT HARDWOODS									
AREA	10,615	410	11,397	21,780	4,618	218	4	4	49,046
GTV	——	24,702	1,400,893	3,596,580	901,882	46,355	713	589	5,971,714
HARD MAPLE									
AREA	55,735	1,513	33,175	117,088	69,853	9,732	1,273	545	288,914
GTV	——	56,546	2,682,792	14,427,977	11,335,427	1,851,642	254,563	118,602	30,727,549
YELLOW BIRCH									
AREA	69	6	358	1,154	730	292	23	3	2,635
GTV	——	307	29,223	137,562	108,135	48,451	4,383	500	328,561
OTHER HARDWOODS									
AREA	37,000	1,354	23,683	38,180	10,703	3,023	687	158	114,788
GTV	——	42,768	1,691,108	4,123,149	1,560,687	504,155	145,392	34,196	8,101,455
TOLERANT HARDWOODS									
AREA	92,804	2,873	57,216	156,422	81,286	13,047	1,983	706	406,337
GTV	——	99,621	4,403,123	18,688,688	13,004,249	2,404,248	404,338	153,298	39,157,565
TOTAL									
AREA	**132,979**	**11,940**	**79,920**	**210,031**	**132,881**	**19,177**	**2,522**	**876**	**590,326**
GTV	——	**340,179**	**7,258,648**	**26,733,822**	**21,218,044**	**3,589,320**	**514,457**	**190,181**	**59,844,651**

Appendix B:

Glossary of Terms

Bold words in the definitions are defined in the glossary.

Age Class: One of the intervals into which the age range of forest **stands** is divided for classification and use.

Age Class Distribution: The location and/or proportionate representation of different age classes in a forest.

Barren and Scattered: Productive forest land which, because of natural or artificial disturbance, contains only scattered trees (stocking below 0.25) or no trees at all with either shrub cover or bare soil, but no significant amount of **regeneration**.

Crop: The vegetation growing on a forest area, more particularly the trees forming **stands**.

Crown (relating to a part of a tree as opposed to a type of land ownership): The upper part of a tree or other woody plant, carrying the main branch system and foliage.

Crown Cover: The ground area covered by a crown, as delimited by the vertical projection of its outermost perimeter.

Establishment: The process of developing a **crop** to the stage at which the young trees may be considered established, i.e., safe from normal adverse influences (e.g., frost, drought, weeds, or browsing) and no longer in need of special **tending**, but only routine **cleaning**, **thinning**, and pruning.

Even-Aged: Applies to **stands** or **forests** in which relatively small age differences exist between individual trees. The maximum difference in age is usually twenty years.

Forest: (Ecology) A plant community predominantly of trees and other woody vegetation, growing more or less closely together; (Silvicultural management) An area managed for the production of timber and other **forest products**, or maintained under woody vegetation for such indirect benefits as protection of **site** or for recreation.

Forest Estate: An area, whatever its ownership, used for **forestry purposes**.

Forest Inventory: A survey of an area to determine such data as area, condition, timber, **volume**, and species, for specific purposes such as planning, purchase, evaluation, management, or **harvesting**.

Forest Management Agreement: A contractual agreement between the Ministry of Natural Resources and a company under the Crown Timber Act to provide for a continuous supply of **forest products** from the designated lands for the wood-processing plants of the company and to ensure that the **forests** on such lands are harvested and regenerated to produce successive **crops** of timber on a **sustained-yield** basis.

Forest Products: Any raw material yielded by trees.

Forest Protection: The branch of **forestry** concerned with the prevention and control of damage to forest arising from fire, insects, pathogens, storm, frost, and other climatic agencies, and also from the action of man.

Forest Regulation: That branch of **forestry** concerned with the technical aspects of organizing and maintaining a forest to fulfil the objectives of forest management.

Forest Stand: see **Stand**.

Forestry: Generally, a profession embracing the science, business, and art of creating, conserving, and managing **forests** and forest lands for the continuing use of their resources, material, or other **forest products**.

Free-to-Grow: **Stands** that meet stocking, height, and/or height growth rate and are judged to be essentially free from competing vegetation.

Gross Merchantable Volume: **Volume** of the main stem, excluding stump and top but including defective and decayed wood, of trees or **stands**.

Gross Total Volume: **Volume** of the main stem, including stump and top as well as defective and decayed wood, of trees or **stands**.

Growing Stock: All the trees growing in a forest or in a specified part of it, generally expressed in terms of number or volume.

Harvesting: The removal of **forest products** for utilization comprising cutting and sometimes initial processing and extraction.

Management Unit: A **forest estate** organized for efficient administration and control and operated according to one management plan. In Ontario there are three types of management units: (i) Crown management units, formed to permit **sustained yield** operations from unlicenced Crown lands and aggregates of small licenced areas; (ii) company management units, where sufficient areas of Crown timber for sustained-yield operation have been licensed to one company: and (iii) **Forest Management Agreement** forests.

Maturity: The stage at which a tree, **crop**, or **stand** best fulfils the purpose for which it was maintained.

Maximum Allowable Depletion (MAD): The calculated amount of area from which timber may be depleted over the five-year term of a **Timber Management Plan** by any means, including **harvesting**, fire, insects, disease, inoperability, or because of the allocation of the area to other uses to fulfil the objectives of management.

Net Merchantable Volume: **Volume** of the main stem, excluding stump and top as well as defective and decayed wood, of trees or **stands**.

Non-Forested Land: Land withdrawn from timber production for at least the next rotation.

Non-Productive Forest Land: Land within a forested area which is incapable of commercial timber production owing to very low productivity.

Normal Yield Table: A **yield table** which is based on optimally stocked natural stands.

Not Satisfactorily Regenerated (NSR): Productive forest land not stocked to a specified standard or which has not attained **free-to-grow** status.

NSR Class 1: These areas have regenerated to satisfactory **stocking** and are free-to-grow. It should be noted that NSR Class 1 land is a transitional category.

NSR Class 2: These areas have regenerated to satisfactory stocking but are not free-to-grow, and require **tending** treatment. The assumption here is that tending involves one or more aerial spray application of herbicide on the overtopping competition which can be carried out at current cost.

NSR Class 3: These areas have not regenerated to satisfactory stocking but could be regenerated through normal treatment methods at current costs. Normal treatments include **site preparation**, planting or **seeding**, and tending.

NSR Class 4: These areas have not regenerated to satisfactory stocking but could be regenerated using existing technology at costs of 50 percent to 100 percent greater than current costs (special equipment or techniques may be needed thereby increasing the cost above the current levels). This category will most commonly apply to older cutovers with heavy residual content or difficult terrain.

NSR Class 5: These areas have not regenerated to satisfactory stocking and cannot be regenerated using existing technology except at costs greater than 100 percent over current treatment costs. This category will most commonly apply to cutovers with very heavy residual content or very difficult terrain, wetness, or access problems. This class can be subdivided where:

(i) Costs are excessive due to lack of access. A change in accessibility would allow these lands to be reclassified to class 3 or 4.

(ii) Costs are excessive due to terrain or technical problems.

NSR Class 6: These areas have been depleted

(i) within the last five years and are not yet subject to the fifth-year stocking assessment, or

(ii) five or more years in the past and are regenerated to satisfactory stocking and do not require tending, but cannot be classed as free-to-grow because of insufficient height or height growth.

Population: The aggregate of all units, finite or infinite, forming the subjects of study.

Production Forest: All **productive forest land** managed primarily for growing timber for industry, unless otherwise reassigned.

Production Forest Reserve: Production forest **stands** which in the opinion of photointerpreters may constitute a logging or silvicultural problem.

Productive Forest Land: All forest areas capable of growing commercial timber.

Protection Forest: All **productive forest land** managed primarily to exert beneficial influence on soil, water, and the overall landscape.

Regeneration: The renewal of a tree **crop** whether by natural (self-sown seed or by vegetative means) or artificial means (sowing and planting). This term may also be used to describe the young crop itself.

Rotation: The planned number of years between the year of harvest of one **crop** to the harvest of the next crop to a specified condition at **maturity**.

Sample: A part of a **population** consisting of one or more **sampling units** selected and examined as representative of the whole.

Sampling Unit: The ultimate unit of assessment or measurement in a **sample**. It may be the individual (e.g., a sample tree), any given number of individuals, a given area of ground, etc..

Silvics: The study of the life history and general characteristics of forest trees and **stands** with particular reference to locality factors, as a basis for the practice of **silviculture**.

Silviculture: Generally, the science and art of cultivating forest **crops**, based on a knowledge of **silvics**. More particularly, the theory and practice of controlling the **establishment** composition, constitution, and growth of **forests**.

Silvicultural System: A process, following accepted silvicultural principles, whereby **crops** constituting **forest** are **tended**, **harvested**, and **regenerated**, resulting in the production of crops of distinctive form. Systems are conveniently classified according to the method of harvesting the mature **stands** with a view to regeneration and according to the type of crop produced thereby.

Site: An area considered in terms of environment, particularly as this determines the type and quality of the vegetation the area can carry.

Site Preparation: Disturbance of the forest floor and the topsoil to create suitable conditions for natural or artificial **regeneration** by mechanical or chemical means, or by prescribed burning.

Site Class: A measure of the relative productive capacity of a **site** for a particular species. The average height at a given age is generally the basis for classification.

Stand: A community of trees possessing sufficient uniformity in composition, constitution, age, arrangement, or condition to be distinguished from adjacent communities, so forming a silvicultural or management entity.

Stocking: An expression of the adequacy of tree cover on an area, in terms of crown cover, percentage of stocked quadrats, number of trees, basal area, or **volume**, in relation to a pre-established managerial norm.

Sustained Yield: The growth of timber that a **forest** can produce and that can be cut to achieve a continuous approximate balance between the growth of timber and timber and timber cut.

Tending: Generally, any operation carried out for the benefit of a forest **crop** at any stage of its life, e.g., **cleaning**, **thinning**, spraying; typically in an **even-aged forest**.

Thinning: A **tending** operation where a cut is made in a **stand**, usually past the sapling stage, for the purpose of stimulating the growth and improving the quality of the stand.

Timber Management Plan: Written document containing pertinent information and prescription by means of which **forest** policy, aims, and objectives are translated into a continuity of specific treatments on a **forest estate** for a specified period of years.

Uneven-Aged: **Stands** or **forests** in which trees markedly differ in age.

Volume: The amount of wood in a tree, **stand**, or other specified area, according to some unit of measurement or some standard of use. See also **Gross Merchantable Volume**, **Gross Total Volume**, **Net Merchantable Volume**.

Working Group: An aggregate of **stands**, including potential forest areas assigned to this category, having the same predominant species, and managed under the same **rotation** and broad silvicultural system.

Yield Table: A table showing for one or more species the volume that can be expected per unit area in a **stand** on a given site at a given age. Yield tables may also include mean diameter, height, stems per unit area, current annual increment, and mean annual increment information.